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THE BOTANY

OF

THE ANTARCTIC VOYAGE

OF

H.M. DISCOVERY SHIPS *EREBUS* AND *TERROR*,

IN THE YEARS 1839–1843,

UNDER THE COMMAND OF

CAPTAIN SIR JAMES CLARK ROSS, Kt., R.N., F.R.S. & L.S., ETC.

BY

JOSEPH DALTON HOOKER, M.D., R.N., F.R.S. & L.S., ETC.

ASSISTANT SURGEON OF THE "EREBUS," AND BOTANIST TO THE EXPEDITION.

PART III.

FLORA TASMANIÆ.

VOL. I.

DICOTYLEDONES.

Published under the Authority of the Lords Commissioners of the Admiralty.

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LINCOLN'S INN FIELDS.

TO

RONALD CAMPBELL GUNN, F.R.S., F.L.S.,

AND

WILLIAM ARCHER, F.L.S.,

This Flora of Tasmania,

WHICH OWES SO MUCH TO THEIR INDEFATIGABLE EXERTIONS,

IS DEDICATED

BY THEIR VERY SINCERE FRIEND,

J. D. HOOKER.

Royal Gardens, Kew,

January, 1860.

PREFACE.

The 'Flora of Tasmania' completes the series of works on the Botany of the "Antarctic Expedition," with the publication of which I was entrusted by Her Majesty's Lord Commissioners of the Admiralty in 1843. Of these, the First Series, on the Botany of the Antarctic Islands, was completed in two volumes, with two hundred plates, in 1847; when the work was interrupted by my being sent on a Botanical mission to India by Her Majesty's Commissioners of Woods and Forests.

During my absence on that mission the rapid progress of geographical discovery in our southern Colonial possessions, the increased exertions of our Botanical correspondents there, who were stimulated by the prospect of a speedy publication of their discoveries, and the activity of the officers of several surveying expeditions, had combined to augment the amount of materials to be examined and described for the Second and Third Series which comprise the Floras of New Zealand and Tasmania, to an extent so many times greater than had ever been contemplated, that I had no choice but to abandon the original plan of making complete Floras, or to devote a great deal more time to them than I had ever proposed to expend.

My Publisher, Mr. Reeve, having offered to enlarge the Floras as much as I should find necessary, free of all cost to myself, I had no hesitation in adopting the latter alternative; and whilst still engaged on the publication of the New Zealand Flora, I had the unexpected gratification of receiving from the Governor and Parliament of Tasmania the announcement that they had unanimously awarded me a grant of £350, in consideration of my services in the investigation of the Flora of the Southern Hemisphere, especially that of Tasmania. At the same time I received the most encouraging assistance from my friend William Archer, Esq., of Cheshunt, Tasmania, who forwarded to me a beautiful series of drawings of Tasmanian Orchids, together with £100 to be expended on the Flora; and he soon afterwards arrived himself in England, and rendered me still more valuable aid by his observations and collections, which is duly acknowledged in the body of this work. I have thus been enabled greatly to extend the letterpress and illustrations of this Flora, by putting figures of many more species on the plates; making the descriptions fuller, adding thirty plates, including sixty species, chiefly of *Orchideæ* (of many of which Mr. Archer had prepared the drawings), and by appending 130 pages devoted to general considerations on the Botany of Australia

and other southern countries :*—thus more than doubling the extent of the work in respect of letterpress and illustrations of species.

It remains for me to record my obligations to the unrivalled botanical artist, Mr. Fitch, who has, with few exceptions, lithographed the whole of the plates, and drawn the majority of them. The accompanying microscopic analyses (amounting to upwards of 4,500) have been made partly by him, partly by myself, and partly by the distinguished Botanists who have aided me in the Cryptogamic portions of the several Floras. I am especially indebted to the Rev. M. J. Berkeley for the descriptions and analyses of all the *Fungi;* to Dr. Harvey for the descriptions of the *Algæ* of the first series, as well as for the lithographs and analyses of the species figured in the Tasmanian and New Zealand Floras; to W. Wilson, Esq., for the analyses and descriptions of most of the *Musci;* to the Rev. C. Babington and Mr. W. Mitten, for the descriptions of the Lichens in these Floras; and to Mr. Mitten for those of the *Hepaticæ*, and their illustrations, in the New Zealand and Tasmanian Floras.

I have also sincere pleasure in thanking Mr. Reeve for having, from the commencement, guaranteed the publication of the whole series; and for the spirited and liberal manner in which he has co-operated with me throughout.

The following are the dates of publication, and the contents of the several Parts :—

I. Flora Antarctica.

Part I.—*Flora of Lord Auckland and Campbell's Islands.*

Date of publication, 1843–1845; pp. 208; Species 370; Plates 80 (and Map); Species figured 150.

Part II.—*Flora of Fuegia, the Falkland Islands, etc.*

Date of publication, 1845–1847; pp. 366; Species 1000; Plates 120; Species figured 220.

The Cryptogamic portions of these Parts were also issued separately.

Part III.—*Flora of New Zealand.*

Date of publication, 1851–1853 :—

Vol. 1.—pp. 355; Species (Phænog.) 730; Plates 70; Species figured 83.

Vol. 2.—pp. 378; Species (Cryptog.) 1037; Plates 60; Species figured 230.

Part IV.—*Flora of Tasmania.*

Date of publication, 1853–1859 :—

Vol. 1.—pp. 550 (with Introd., Key, etc.); Species (Dicot.) 758; Plates 100; Species figured 138.

Vol. 2.—pp. 422; Species (Monocot. and Acot.) 1445; Plates 100; Species figured 274.

Total—6 volumes, containing about 3000 Species in all; and 530 Plates, illustrating 1095 Species.

* The grant made by the Treasury to aid in the publication of the Botany of the Antarctic Voyage was £1000, to be expended solely in the drawing and lithographing of 500 quarto coloured plates. These, with the descriptive matter, have been given by the Author free of all cost, and of all share in the proceeds of the undertaking, to the Publisher, who has thus been enabled to bring out the series at a very much more moderate price than any similar work.

INTRODUCTORY ESSAY.

§ 1.

Preliminary Remarks.

The Island of Tasmania does not contain a vegetation peculiar to itself, nor constitute an independent botanical region. Its plants are, with comparatively few exceptions, natives of extratropical Australia; and I have consequently found it necessary to study the vegetation of a great part of that vast Continent, in order to determine satisfactorily the nature, distribution, and affinities of the Tasmanian Flora.

From the study of certain extratropical genera and species in their relation to those of Tasmania, I have been led to the far more comprehensive undertaking of arranging and classifying all the Australian plants accessible to me. This I commenced in the hope of being able thereby to extend our knowledge of the affinities of its Flora, and, if possible, to throw light on a very abstruse subject, viz. the origin of its vegetation, and the sources or causes of its peculiarity. This again has induced me to proceed with the inquiry into the origin and distribution of existing species; and, as I have already treated of these subjects in the Introduction to the New Zealand Flora, I now embrace the opportunity afforded me by a similar Introduction to the Tasmanian Flora, of revising the opinions I then entertained, and of again investigating the whole subject of the creation of species by variation, with the aid of the experience derived from my subsequent studies of the Floras of India and Australia in relation to one another and to those of neighbouring countries, and of the recently published hypotheses of Mr. Darwin and Mr. Wallace.

No general account of the Flora of Australia having hitherto been published, nor indeed a complete Flora of any part of it, I have been obliged, as a preliminary measure, to bring together and arrange the scattered materials (both published and unpublished) relating to its vegetation to which I had access. Those which are published consist of very numerous papers relating to the general botany of Australia, in scientific periodicals, and appended to books of travel, amongst which by far the most important are Brown's 'General Remarks, Geographical and Systematical, on the Botany of Terra Australis,' published in the Appendix to Captain Flinders' Voyage, now nearly half a century ago; Allan Cunningham's Appendix to Captain King's Voyage, which appeared in 1827; Lindley's Report on the Swan River Botany; and Mueller's, on the Tropical Botany of Australia. There are also some special essays or descriptive works on the Floras of certain parts of the continent: of

these the most important are Brown's 'Prodromus,' of which the only published volume appeared in 1810; the 'Plantæ Preissianæ,' edited by Professor Lehmann, and containing descriptions, by various authors, of about 2250 species (including Cryptogamiæ) of Swan River plants; Dr. Mueller's various Reports on the Flora of Victoria, and his numerous papers on the vegetable productions of that colony; and Lindley's Appendices to Mitchell's Travels.

The unpublished materials chiefly consist of the vast collections of Australian plants made during the last half-century, and these having been obtained from all parts of the continent, and carefully ticketed as to locality, etc., supply abundant materials for the investigation of the main features of the Australian Flora. In another part of this Essay I propose to give a short summary of the labours of the individuals by whom these and other Australian collections have been principally obtained, and of the routes followed by the expeditions which they accompanied.

The majority of the collections were, either wholly or in part, transmitted to Sir William Hooker, forming the largest Australian herbarium in existence, and of which the published portion is in value greatly exceeded by the unpublished; for although about two-thirds of the plants have been described, only about half of these have been brought together in a systematic form; nor, since the publication of Brown's Appendix to Flinders' Voyage, has the Flora of the whole continent been considered from a general point of view. And, before entering on the field of inquiry so successfully explored by Brown half a century ago, I must pay my tribute to the sagacity and research exhibited in the essay to which I have alluded. At the time of its publication, not half the plants now described were discovered, vast areas were yet unexplored, and far too little was known of the vegetation of the neighbouring islands to admit of the Australian Flora being studied in its relation to that of other countries. Nevertheless we are indebted to Brown's powers of generalization for a plan of the entire Flora, constructed out of fragmentary collections from its different districts, which requires but little correction from our increased knowledge, though necessarily very considerable amplification. Although he could not show the extent and exact nature of its affinities, he could predict many of them, and by his detection of the representatives of plants of other countries under the masks of structural peculiarity which disguise them in Australia, he long ago gave us the key to the solution of some of those great problems of distribution and variation, which were then hardly propounded, but which are now prominent branches of inquiry with every philosophical naturalist.

In the Introductory Essay to the New Zealand Flora, I advanced certain general propositions as to the origin of species, which I refrained from endorsing as articles of my own creed: amongst others was the still prevalent doctrine that these are, in the ordinary acceptation of the term, created as such, and are immutable. In the present Essay I shall advance the opposite hypothesis, that species are derivative and mutable; and this chiefly because, whatever opinions a naturalist may have adopted with regard to the origin and variation of species, every candid mind must admit that the facts and arguments upon which he has grounded his convictions require revision since the recent publication by the Linnean Society of the ingenious and original reasonings and theories of Mr. Darwin and Mr. Wallace.

Further, there must be many who, like myself, having hitherto refrained from expressing any positive opinion, now, after a careful consideration of these naturalists' theories, find the aspect of the question materially changed, and themselves freer to adopt such a theory as may best harmonize with the facts adduced by their own experience.

The Natural History of Australia seemed to me to be especially suited to test such a theory, on account of the comparative uniformity of its physical features being accompanied with a great

variety in its Flora; of the differences in the vegetation of its several parts; and of the peculiarity both of its Fauna and Flora, as compared with those of other countries. I accordingly prepared a classified catalogue of all the Australian species in the Herbarium, with their ranges in longitude, latitude, and elevation, as far as I could ascertain them, and added what further information I could obtain from books. At the same time I made a careful study of the affinities and distribution of all the Tasmanian species, and of all those Australian ones which I believed to be found in other countries. I also determined as accurately as I could the genera of the remainder, and especially of those belonging to genera which are found in other countries, and I distinguished the species from one another in those genera which had not been previously arranged. In this manner I have brought together evidence of nearly 8000 flowering plants having been collected or observed in Australia, of which I have seen and catalogued upwards of 7000. About two-thirds of these are ascertained specifically with tolerable accuracy, and the remainder are distinguished from one another, and referred to genera with less certainty, being either undescribed, or described under several names, whilst some are members of such variable groups that I was left in doubt how to dispose of them.

To many who occupy themselves with smaller and better worked botanical districts, such results as may be deduced from the skeleton Flora I have compiled for Australia may seem too crude and imperfect to form data from which to determine its relations. But it is not from a consideration of specific details that such problems as those of the relations of Floras and the origin and distribution of organic forms will ever be solved, though we must eventually look to these details for proofs of the solutions we propose. The limits of the majority of species are so undefinable that few naturalists are agreed upon them;* to a great extent they are matters of opinion, even amongst those persons who believe that species are original and immutable creations; and as our knowledge of the forms and allies of each increases, so do these differences of opinion; the progress of systematic science being, in short, obviously unfavourable to the view that most species are limitable by descriptions or characters, unless large allowances are made for variation. On the other hand, when dealing with genera, or other combinations of species, all that is required is that these be classified in natural groups; and that such groups are true exponents of affinities settled by Nature is abundantly capable of demonstration. It is to an investigation of the extent, relations, and proportions of these natural combinations of species, then, that we must look for the means of obtaining and expressing the features of a Flora; and if in this instance the exotic species are well ascertained, it matters little whether or not the endemic are in all cases accurately distinguished from one another. Further, in a Flora so large as that of Australia, if the species are limited and estimated by one mind and eye, the errors made under each genus will so far counteract one another, that the mean results for the genera and orders will scarcely be affected. As it is, the method adopted has absorbed many weeks of labour during the last five years, and a much greater degree of accuracy could only have been obtained by a disproportionately greater outlay of time, whilst it would not have materially affected the general results.

With regard to my own views on the subjects of the variability of existing species and the fallacy of supposing we can ascertain anything through these alone of their ancestry or of originally created types, they are, in so far as they are liable to influence my estimate of the value of the facts collected for the analysis of the Australian Flora, unaltered from those which I maintained in the

* The most conspicuous evidence of this lies in the fact, that the number of known species of flowering plants is by some assumed to be under 80,000, and by others over 150,000.

'Flora of New Zealand:' on such theoretical questions, however, as the origin and ultimate permanence of species, they have been greatly influenced by the views and arguments of Mr. Darwin and Mr. Wallace above alluded to, which incline me to regard more favourably the hypothesis that it is to variation that we must look as the means which Nature has adopted for peopling the globe with those diverse existing forms which, when they tend to transmit their characters unchanged through many generations, are called species. Nevertheless I must repeat, what I have fully stated elsewhere, that these hypotheses should not influence our treatment of species, either as subjects of descriptive science, or as the means of investigating the phenomena of the succession of organic forms in time, or their dispersion and replacement in area, though they should lead us to more philosophical conceptions on these subjects, and stimulate us to seek for such combinations of their characters as may enable us to classify them better, and to trace their origin back to an epoch anterior to that of their present appearance and condition. In doing this, however, the believer in species being lineally related forms must employ the same methods of investigation and follow the same principles that guide the believer in their being actual creations, for the latter assumes that Nature has created species with mutual relations analogous to those which exist between the lineally-descended members of a family, and this is indeed the leading idea in all natural systems. On the other hand, there are so many checks to indiscriminate variation, so many inviolable laws that regulate the production of varieties, the time required to produce wide variations from any given specific type is so great, and the number of species and varieties known to propagate for indefinite periods a succession of absolutely identical members is so large, that all naturalists are agreed that for descriptive purposes species must be treated as if they were at their origin distinct, and are destined so to remain. Hence the descriptive naturalist who believes all species to be derivative and mutable, only differs in practice from him who asserts the contrary, in expecting that the posterity of the organisms he describes as species may, at some indefinitely distant period of time, require redescription.

I need hardly remark that the classificatory branch of Botany is the only one from which this subject can be approached, for a good system must be founded on a due appreciation of all the attributes of individual plants,—upon a balance of their morphological, physiological, and anatomical relations at all periods of their growth. Species are conventionally assumed to represent, with a great amount of uniformity, the lowest degree of such relationship; and the facts that individuals are more easily grouped into species limited by characters, than into varieties, or than species are into limitable genera or groups of higher value, and that the relationships of species are transmitted hereditarily in a very eminent degree, are the strongest appearances in favour of species being original creations, and genera, etc., arbitrarily limited groups of these.

The difference between varieties and species and genera in respect of definable limitation is however one of degree only, and if increased materials and observation confirm the doctrine which I have for many years laboured to establish, that far more species are variable, and far fewer limitable, than has been supposed, that hypothesis will be proportionally strengthened which assumes species to be arbitrarily limited groups of varieties. With the view of ascertaining how far my own experience in classification will bear out such a conclusion, I shall now endeavour to review, without reference to my previous conclusions, the impressions which I have derived from the retrospect of twenty years' study of plants. During that time I have classified many large and small Floras, arctic, temperate, and tropical, insular and continental: embracing areas so extensive and varied as to justify, to my apprehension, the assumption that the results derived

from these would also be applicable to the whole vegetable kingdom. I shall arrange these results successively under three heads; viz. facts derived from a study of classification; secondly, from distribution; thirdly, from fossils; after which I shall examine the theories with which these facts should harmonize.

§ 2.

On the General Phenomena of Variation in the Vegetable Kingdom.

1. All vegetable forms are more or less prone to vary as to their sensible properties, or (as it has been happily expressed in regard to all organisms), "they are in a state of unstable equilibrium."* No organ is exactly symmetrical, no two are exact counterparts, no two individuals are exactly alike, no two parts of the same individual exactly correspond, no two species have equal differences, and no two countries present all the varieties of a species common to both, nor are the species of any two countries alike in number and kind.

2. The rate at which plants vary is always slow, and the extent or degree of variation is graduated. Sports even in colour are comparatively rare phenomena, and, as a general rule, the best-marked varieties occur on the confines of the geographical area which a species inhabits. Thus the scarlet Rhododendron (*R. arboreum*) of India inhabits all the Himalaya, the Khasia Mountains, the Peninsular Mountains, and Ceylon; and it is in the centre of its range (Sikkim and the Khasia) that those mean forms occur which by a graduated series unite into one variable species the rough, rusty-leaved form of Ceylon, and the smooth, silvery-leaved form of the North-western Himalaya. A white and a rose-coloured sport of each variety is found growing with the scarlet in all these localities, but everywhere these sports are few in individuals. Also certain individuals flower earlier than others, and some occasionally twice a year, I believe in all localities.

3. I find that in every Flora all groups of species may be roughly classified into three large divisions: one in which most species are apparently unvarying; another in which most are conspicuously varying; and a third which consists of a mixture of both in more equal proportions. Of these the unvarying species appear so distinct from one another that most botanists agree as to their limits, and their offspring are at once referable by inspection to their parents; each presents several special characters, and it would require many intermediate forms to effect a graduated change from any one to another. The most varying species, on the contrary, so run into one another, that botanists are not agreed as to their limits, and often fail to refer the offspring with certainty to their parents, each being distinguished from one or more others by one or a few such trifling characters, that each group may be regarded as a continuous series of varieties, between the terms of which no hiatus exists suggesting the intercalation of any intermediate variety. The genera *Rubus, Rosa, Salix,* and *Saxifraga,* afford conspicuous examples of these unstable species; *Veronica, Campanula,* and *Lobelia,* of comparatively stable ones.

4. Of these natural groups of varying and unvarying species, some are large and some small; they are also very variously distributed through the classes, orders, and genera of the Vegetable Kingdom; but, as a general rule, the varying species are relatively most numerous in those classes, orders, and genera which are the simplest in structure.† Complexity of structure is generally ac-

* Essays: Scientific, Political, and Speculative; by Herbert Spencer: p. 280.

† Mr. Darwin, after a very laborious analysis of many Floras, finds that the species of large genera are relatively more variable than those of small; a result which I was long disposed to doubt, because of the number of variable

companied with a greater tendency to permanence in form: thus Acotyledons, Monocotyledons, and Dicotyledons are an ascending series in complexity and in constancy of form. In Dicotyledons, *Salices*, *Urticeæ*, *Chenopodiaceæ*, and other Orders with incomplete or absent floral envelopes, vary on the whole more than *Leguminosæ*, *Lythraceæ*, *Myrtaceæ*, or *Rosaceæ*, yet members of these present, in all countries, groups of notoriously varying species, as *Eucalyptus* in Australia, *Rosa* in Europe, and *Lotus*, *Epilobium*, and *Rubus* in both Europe and Australia. Again, even genera are divided: of the last named, most or all of the species are variable; of others, as *Epacris*, *Acacia*, and the majority of such as contain upwards of six or eight species, a larger or smaller proportion only are variable. But the prominent fact is, that this element of mutability pervades the whole Vegetable Kingdom; no class nor order nor genus of more than a few species claims absolute exemption, whilst the grand total of unstable forms generally assumed to be species probably exceeds that of the stable.

5. The above remarks are equally applicable to all the higher divisions of plants. Some genera and orders are as natural, and as limitable by characters, as are some species; others again, though they contain many very well-marked subordinate plans of construction, yet are so connected by intermediate forms with otherwise very different genera or orders, that it is impossible to limit them naturally. And as some of the best marked and limited species consist of a series of badly marked and illimitable varieties, so some of the most natural* and limitable orders and genera may respectively consist of only undefinable groups of genera or of species. For instance, both *Gramineæ* and *Compositæ* are, in the present state of our knowledge, absolutely limited Orders, and extremely natural ones also; but their genera are to a very eminent degree arbitrarily limited, and their species extremely variable. *Orchideæ* and *Leguminosæ* are also well-limited Orders (though

small genera and the fact that monotypic genera seldom have their variations recorded in systematic works, but an examination of his data and methods compels me to acquiesce in his statement. It has also been remarked (Bory de Saint-Vincent, Voy. aux Quatre Iles de l'Afrique) that the species of islands are more variable than those of continents, an opinion I can scarcely subscribe to, and opposed to Mr. Darwin's facts, inasmuch as insular Floras are characterized by peculiar genera, and by having few species in proportion to genera. Bisexual trees and shrubs are generally more variable than unisexual, which however is only a corollary from what is stated above regarding plants of simple structure of flower. On the whole, I think herbs are more variable than shrubby plants, and annuals than perennials. It would be curious to ascertain the relative variableness of social and scattered plants. The individuals of a social plant, in each area it is social upon, are generally very constant, but individuals from different areas often differ much. The *Pinus sylvestris*, *Mughus*, and *uncinata* are cases in point, if considered as varieties of one; as are the Cedars of Atlas, Algeria, and the Himalaya.

* It should be borne in mind that the term *natural*, as applied to Orders or other groups, has often a double significance; every natural order is so in the sense of each of its members being more closely related to one or more of its own group than to any of another; but the term is often used to designate an easily limited natural order, that is, one whose members are so very closely related to each other by conspicuous peculiarities that its differential characters can be expressed, and itself always recognized; these may be called *objective* Orders; *Orchideæ* and *Gramineæ* are examples. Any naturalist, endowed with fair powers of observation and generalization, recognizes the close affinity between a pseudobulbous epiphytical, and a terrestrial tuberous-rooted Orchid, or between the Bamboo and Wheat, though the differences are exceedingly great in habit and in organs of vegetation and reproduction. Other orders are as natural and may be as well limited, but having no conspicuous characters in common, and presenting many subordinate distinct plans of structure, may be regarded as *subjective*. Such are *Ranunculaceæ* and *Leguminosæ*, of which a botanist must have a special and extensive knowledge before he can readily recognize very many of their members. No degree of natural sagacity will enable an uninstructed person to recognize the close affinity of *Clematis* and *Ranunculus*, or of *Acacia* and *Cytisus*, though these are really as closely related as the Orchids and Grasses mentioned above. We do not know why some Orders are subjective and some objective; but if the theory of creation by variation is a true one, we ought through it to reach a solution.

not so absolutely as the former), but they, on the contrary, consist of comparatively exceedingly well-marked genera and species. *Melanthaceæ* and *Scrophularineæ*, on the other hand, are not limitable as Orders, and contain very many differently constructed groups; but their genera, and to a great extent their species also, are well-marked and limitable. The circumstance of a group being either isolated or having complex relations, is hence no indication of its members having the same characters.

Again, as with species, so with genera and orders, we find that upon the whole those are the best limited which consist of plants of complex floral structure: the Orders of Dicotyledons are better limited than those of Monocotyledons, and the genera of Dichlamydeæ than those of Achlamydeæ.*

Now my object in dwelling on this parallelism between the characteristics of individuals in relation to species, of species in relation to genera, and of genera in relation to Orders, is because I consider (Introd. Essay to Fl. N. Z.) that it is to the extinction of species and genera that we are indebted for our means of resolving plants into limitable genera and orders. This view is now, I believe, generally admitted, even by those who still regard species as the immutable units of the Vegetable Creation; and it therefore now remains to be seen how far we are warranted in extending it to the limitation of species by the elimination of their varieties through natural causes.†

6. The evidence of variability thus deduced from a rapid general survey of the prominent facts elicited from a study of the principles of classification, are to a certain extent tested by the behaviour of plants under cultivation, which operates either by hastening the processes of Nature (in rapidly inducing variation), or by effecting a prolepsis or anticipation of those processes (in producing sports, *i. e.* better marked varieties, without graduated stages), or by placing the plant in conditions to which it would never have been exposed in the ordinary course of natural events, and which eventually either kill it or give origin to a series of varieties which might otherwise have never existed.‡

* There are too many exceptions to this to admit of our concluding at once that it is attributable to any simple and uniform law of variation; but it may be explained by assuming that the degree or amount of variation is differently manifested at different epochs in the history of the group. Thus, if a genus is numerically increasing, and consequently running into varieties, it will present a group of species with complex relations *inter se;* if, on the contrary, it is numerically decreasing, such decrease must lead to the extinction of some varieties, and hence result in the better limitation of the remainder. The application of this assumption to the fact of the best limited groups being most prevalent among the higher classes (*i. e.* among those most complicated in their organization), would at first sight appear an argument against progression, were it not for the consideration that the higher tribes of plants have in another respect proved themselves superior, in that they have not only far surpassed the lower in number of genera and species, but in individuals, and also in bulk and stature. And lastly, as all the highest orders of plants contain numerous species and often genera of as simple organization as any of the lower orders are, it follows that that physical superiority which is manifested in greater extent of variation, in better securing a succession of race, in more rapid multiplication of individuals, and even in increase of bulk, is in some senses of a higher order than that represented by mere complexity or specialization of organ.

† It follows as a corollary to the proposition (That species, etc., are naturally rendered limitable by the destruction of varieties), that there must be some intimate relation between the rate of increase and the duration of genera (or other groups of species) on the one hand, and the limitability of their species on the other. Thus, when a genus consists of a multitude of illimitable forms, we may argue with much plausibility that it is on the increase, because no intermediates have as yet been destroyed, and that the birth of individuals and the production of new forms is proceeding at a greater proportional rate than in an equally large genus of which the species are limitable.

‡ My friend Mr. Wallace treats of animals under domestication, not only as if they were in very different physical conditions from those in a state of nature, inasmuch as every sense and faculty is continually fully exercised and strengthened by wild animals, whilst certain of these lie dormant in the domesticated, but as if they were

7. Now the prominent phenomena presented by species under cultivation are analogous in kind and extent to those which we have derived from a survey of the affinities of plants in a state of nature: a large number remain apparently permanent and unalterable, and a large number vary indefinitely. Of the permanent there is little to remark, except that they belong to very many orders of plants, nor are they always those which are permanent in a state of nature. Many plants, acknowledged by all to be varieties, may be propagated by seed or otherwise, when their offspring retains for many successive generations the characters of the variety. On the other hand, species which have remained immutable for many generations under cultivation, do at length commence to vary, and having once begun, are thereafter peculiarly prone to vary further.

8. The variable cultivated species present us with the most important phenomena for investigating the laws of mutability and permanence; but these phenomena are so infinitely varied, complex, and apparently contradictory, as to defeat all attempts to elucidate the history of any individual case of variation by a study of its phases alone. It would often appear doubtful whether the natural operations of a plant tend most to induce or to oppose variation; and we hence find the advocates of original permanent creations, and those of mutable variable species, taking exactly opposite views in this respect, the truth, I believe, being that both are right. Nature has provided for the possibility of indefinite variation, but she regulates it as to extent and duration; she will neither allow her offspring to be weakened or exhausted by promiscuous hybridization and incessant variation, nor will she suffer a new combination of external conditions to destroy one of these varieties without providing a substitute when necessary; hence some species remain so long hereditarily immutable as to give rise to the doctrine that all are so normally, while others are so mutable as to induce a belief in the very opposite doctrine, which demands incessant lawless change.

9. It would take far too long a time were I to attempt any analysis of the phenomena of cultivation, as illustrative of those of variability in a state of nature. There are however some broad facts which should be borne in mind in treating of variation by cross impregnation and hybridity.

10. Variation is effected by graduated changes; and the tendency of varieties, both in nature and under cultivation, when further varying, is rather to depart more and more widely from the original type, than to revert to it: the best marked varieties of a wild species occurring on the confines of the area the species inhabits, and the best marked varieties of the cultivated species being those last produced by the gardener. I am aware that the prevalent opinion is that there is a strong tendency in cultivated, and indeed in all varieties, to revert to the type from which they departed; and I have myself quoted this opinion, without questioning its accuracy,* as tending to sup-

subject to the influence of fundamentally different laws. He says, "No inferences as to varieties in a state of nature can be deduced from the observation of those occurring among domestic animals. The two are so much opposed that what applies to the one is almost sure not to apply to the other." But, in the first place, of the same species of wild animals some families must be placed where certain faculties and senses are far more exercised than others, and the difference in this respect between the conditions of many families of wild animals is as great as those between many wild and tame families; and secondly, other senses and faculties, latent and unknown in the wild animal, but which are as proper to the species as any it exercised in its wild state, are manifested or developed by it under domestication. An animal in a state of nature is not then, as Mr. Wallace assumes, "in the full exercise of every part of its organization;" were it so, it could not vary or alter with altered conditions, nor could other faculties remain to be called into play under domestication. The tendency of species when varying cannot be to depart from the original type in a wild condition and to revert to it under domestication, for man cannot invert the order of Nature, though he may hasten or retard some of its processes.

* Fl. N. Zeal., Introd. Essay, p. x., and Flora Indica, Introduction, p. 14.

port the views of those who regard species as permanent. A further acquaintance with the results of gardening operations leads me now to doubt the existence of this centripetal force in varieties, or at least to believe that in the phrase "reversion to the wild type," many very different phenomena are included. In the first place, the majority of cultivated vegetables and cerealia, such as the Cabbage and its numerous progeny, and the varieties of wall-fruit, show when neglected no disposition to assume the characters of the wild states of these plants;* they certainly degenerate, and even die if Nature does not supply the conditions which man (by anticipation of her operations, or otherwise) has provided; they become stunted, hard, and woody, and resemble their wild progenitors in so far as all stunted plants resemble wild plants of similar habit; but this is not a reversion to the original type, for most of these cultivated races are not *merely* luxuriant forms of the wild parent. In neglected fields and gardens we see plants of Scotch Kale, Brussels Sprouts, or Kohl-rabi, to be all as unlike their common parent, the wild *Brassica oleracea*, as they are unlike one another; so, too, most of our finer kinds of apples, if grown from seed, degenerate and become crabs, but in so doing they become crab states of the varieties to which they belong, and do not revert to the original wild Crab-apple. And the same is true to a great extent of cultivated Roses, of many varieties of trees, of the Raspberry, Strawberry, and indeed of most garden plants. It has also been held, that by imitating the conditions under which the wild state of a cultivated variety grows, we may induce that variety to revert to its original state; but, except in the false sense of reversion above explained, I doubt if this is supported by evidence. Cabbages grown by the seaside are not more like wild Cabbages than those grown elsewhere, and if cultivated states disseminate themselves along the coast, they there retain their cultivated form. This is however a subject which would fill a volume with most instructive matter for reflection, and which receives a hundredfold more illustration from the Animal than from the Vegetable Kingdom. I can here only indicate its bearing on the doctrine of variation, as evidence that Nature operates upon mutable forms by allowing great variation, and displaying little tendency to reversion.† With this law the suggestive observation of M. Vilmorin well accords, that when once the constitution of a plant is so broken that variation is induced, it is easy to multiply the varieties in succeeding generations.

It may be objected to this line of argument that our cultivated plants are, as regards their constitution, in an artificial condition, and are, if unaided, incapable of self-perpetuation; but an artificially induced condition of constitution is not necessarily a diseased or unnatural one, and, so far as our cultivated plants are concerned, all we do is to place them under conditions which Nature does not provide *at the same particular place and time*. That Nature might supply the conditions at other places and times may be inferred from the fact that the plant is found to be provided with the means of availing itself of them when provided, while at the same time it retains all its functions, not only unimpaired, but in many cases in a more highly developed state. We have no reason to suppose that we have violated Nature's laws in producing a new variety of wheat,—we may have only anticipated them; nor is its constitution impaired because it cannot, unaided, perpetuate its race; it is in as sound and unbroken health and vigour during its life as any wild variety is, but its offspring

* Hence the great and acknowledged difficulty of determining the wild parent species of most of our cultivated fruits, cerealia, etc., and in fact of almost every member of our Flora Cibaria. This would not be so were there any disposition in the neglected cultivated races to revert to the wild form.

† It is not meant by this that any character of a species which may be lost in its variety never reappears in the descendants of the latter, for some occasionally do so in great force; what is meant is, that the newly acquired characters of the variety are never so entirely obliterated that it has no longer a claim to be considered a variety.

has so many enemies that they do not perpetuate its race. In the case of annual plants, those only can secure the succession of their species which produce more seeds annually than can be eaten by animals or destroyed by the elements. Cultivated wheat will grow and ripen its seed in almost all soils and climates, and as its seeds are produced in great abundance, and can be preserved alive in any quantity, in the same climate, and for many years, it follows that it is not to the artificial or peculiar condition of the plant itself, and still less to any change effected by man upon it, that its annual extinction is due, but to causes that have no effect whatever upon its own constitution, and over which its constitutional peculiarities can exercise no control.

11. Again, the phenomena of cross impregnation amongst individuals of all species appear, according to Mr. Darwin's accurate observations, to have been hitherto much underrated, both as to extent and importance. The prominent fact that the stamens and pistil are so often placed in the same flower, and come to maturity at the same epoch, has led to the doctrine that flowers are usually self-impregnated, and that the effect is a conservative one as regards the permanence of specific forms. The observations of Carl Sprengel and others have, however, proved that this is not always the case, and that while Nature has apparently provided for self-fertilization, she has often insidiously counteracted its operation, not only by placing in flowers lures for insects which cross-fertilize them, but often by interposing insuperable obstacles to self-fertilization, in the shape of structural impediments to the access of the pollen to the stigma of its own flower.* In all these instances the double object of Nature may be traced; for self-impregnation (or "breeding in"), while securing identity of form in the offspring, and hence hereditary permanence, at the same time tends to weakness of constitution, and hence to degeneracy and extinction: on the other hand, cross-impregnation, while tending to produce diversity of form in the offspring, and hence variation and apparent mutability, yet by strengthening the offspring favours longevity and apparent permanence of specific type. The ultimate effect of all these operations is of course favourable to the hypothesis that variability is the rule, and permanence the exception, or at any rate only a transitory phenomenon.

12. Hybridization, or cross-impregnation between species or very well marked varieties, again, is a phenomenon of a very different kind, however similar it may appear in operation and analogous in design. Hybridizable genera are rarer than is generally supposed, even in gardens, where they are so often operated upon, under circumstances the most favourable to the production of a hybrid, and unfavourable to self-impregnation. Hybrids are almost invariably barren, and their characters are not those of new varieties. The obvious tendency of hybridization between varieties or other very closely allied forms (in which case the offspring may be fertile) is not to enlarge the bounds of variation, but to contract them; and if between very different forms, it will only tend to confound these. That some supposed species may have their origin in hybridization cannot be denied, but we are now dealing with phenomena on a large scale, and balancing the tendencies of causes uniformly acting, whose effects are unmistakable, and which can be traced throughout the Vegetable Kingdom. In gardening operations the number of hybridized genera is small, their offspring doomed, and since they are more readily impregnated by the pollen of either parent than by their own,

* Thus, in *Lobelia fulgens*, the pollen is entirely prevented by natural causes from reaching the stigma of its own flower. In kidney beans impregnation takes place imperfectly except the carina is worked up and down artificially, which is effected by bees, who may thus either impregnate the flower with its own pollen or with that brought from another plant. I am indebted to Mr. Darwin for both these facts: see 'Gardeners' Chronicle,' 1858, p. 828.

or by that of any other plant,* they eventually revert to one of their parents: on the other hand, the number of varieties is incalculable, the power to vary further is unimpaired in their progeny, and these tend to depart further and further in sensible properties from the original parent.

In conformity with my plan of starting from the variable and not the fixed aspect of Nature, I have now set down the prominent features of the Vegetable Kingdom, as surveyed from this point of view. From the preceding paragraphs the evidence appears to be certainly in favour of proneness to change in individuals, and of the power to change ceasing only with the life of the individual; and we have still to account for the fact that there are limits to these mutations, and laws that control the changes both as to degree and kind; that species are neither visionary nor even arbitrary creations of the naturalist; that they are, in short, realities, whether only temporarily so or not.

13. Granting then that the tendency of Nature is first to multiply forms of existing plants by graduated changes, and next by destroying some to isolate the rest in area and in character, we are now in a condition to seek some theory of the *modus operandi* of Nature that will give temporary permanence of character to these changelings. And here we must appeal to theory or speculation; for our knowledge of the history of species in relation to one another, and to the incessant mutations of their environing physical conditions, is far too limited and incomplete to afford data for demonstrating the effects of these in the production of any one species in a native state.

Of these speculations by far the most important and philosophical is that of the delimitation of species by natural selection, for which we are indebted to two wholly independent and original thinkers, Mr. Darwin and Mr. Wallace.† These authors assume that all animal and vegetable forms are variable, that the average amount of space and annual supply of food for each species (or other group of individuals) is limited and constant, but that the increase of all organisms tends to proceed annually in a geometrical ratio; and that, as the sum of organic life on the surface of the globe does not increase, the individuals annually destroyed must be incalculably great; also that each species is ever warring against many enemies, and only holding its own by a slender tenure. In the ordinary course of nature this annual destruction falls upon the eggs or seeds and young of the organisms, and as it is effected by a multitude of antagonistic, ever-changing natural causes, each more destructive of one organism than of any other, it operates with different effect on each group of individuals, in every locality, and at every returning season. Here then we have an infinite number of varying conditions, and a superabundant supply of variable organisms, to accommodate themselves to these conditions. Now the organisms can have no power of surviving any change in these conditions, except they are endowed with the means of accommodating themselves to it. The exercise of this power may be accompanied by a visible (morphological) change in the form or structure of the individual, or it may not, in which case there is still a change, but a physiological one, not outwardly

* A very able and careful experimenter, M. Naudin, performed a series of experiments at the Jardin des Plantes at Paris, in order to discover the duration of the progeny of fertile hybrids. He concludes that the fertile posterity of hybrids disappears, to give place to the pure typical form of one or other parent. "Il se peut sans doute qu'il y ait des exceptions à cette loi de retour, et que certains hybrides, à la fois très-fertiles et très-établis, tendent à faire souche d'espèce; mais le fait est loin d'être prouvé. Plus nous observons les phénomènes d'hybridité, plus nous inclinons à croire que les espèces sont indissolublement liées à une fonction dans l'ensemble des choses, et que c'est le rôle même assigné à chacune d'elles qui en détermine la forme, la dimension et la durée." (Annales des Sc. Nat. sér. 4. v. 9.)

† Journal of the Linnean Society of London, Zoology, vol. iii. p. 45.

manifested; but there is always a morphological change if the change of conditions be sudden, or when, through lapse of time, it becomes extreme. The new form is necessarily that best suited to the changed condition, and as its progeny are henceforth additional enemies to the old, they will eventually tend to replace their parent form in the same locality. Further, a greater proportion of the seeds and young of the old will annually be destroyed than of the new, and the survivors of the old, being less well adapted to the locality, will yield less seed, and hence have fewer descendants.

In the above operations Nature acts slowly on all organisms, but man does so rapidly on the few he cultivates or domesticates; he selects an organism suited to his own locality, and by so modifying its surrounding conditions that the food and space that were the share of others falls to it, he ensures a perpetuation of his variety, and a multiplication of its individuals, by means of the destruction of the previous inhabitants of the same locality; and in every instance, where he has worked long enough, he finds that changes of form have resulted far greater than would suffice to constitute conventional species amongst organisms in a state of nature, and he keeps them distinct by maintaining these conditions.

Mr. Darwin adduces another principle in action amongst living organisms as playing an important part in the origin of species, viz. that the same spot will support most life when peopled with very diverse forms, as is exemplified by the fact that in all isolated areas the number of Classes, Orders, and Genera is very large in proportion to that of Species.

§ 3.

On the General Phenomena of Distribution in Area.

Turning now to another class of facts, those that refer to the distribution of plants on the surface of the globe, the following are the most obvious:—

14. The most prominent feature in distribution is that circumscription of the area of species, which so forcibly suggests the hypothesis that all the individuals of each species have sprung from a common parent, and have spread in various directions from it. It is true that the area of some (especially Cryptogamic and Aquatic plants) is so great that we cannot indicate any apparent centre of diffusion, and that others are so sporadic that they appear to have had many such centres; but these species, though more numerous than is usually supposed, are few in comparison with those that have a definite or circumscribed area.

With respect to this limitation in area,* species do not essentially differ from varieties on the one hand, or from genera and higher groups on the other; and indeed, in respect of distribution, they hold an exactly intermediate position between them, varieties being more restricted in locality than species, and these again more than genera.

* It is a remarkable fact that there are some striking anomalies in the distribution of plants into provinces, as compared with animals. Thus there is no peculiarity in the vegetation of Australia to be compared with the rarity of placental mammals, nor with the fact of so many of the mammals, birds, and fish of Tasmania differing from those of the continent of Australia. Nearer home, we find the basin of the Mediterranean with a tolerably uniform Flora on the European and North African sides, but these ranking as different zoological provinces. The much narrower delimitation in area of animals than plants, and greater restriction of Faunas than Floras, should lead us to anticipate that plant types are, geologically speaking, more ancient and permanent than the higher animal types are, and so I believe them to be, and I would extend the doctrine even to plants of highly complex structure.

The universality of this feature (of groups having defined areas) affords to my mind all but conclusive evidence in favour of the hypothesis of similar forms having had but one parent, or pair of parents. And further, this circumscription of species and other groups in area, harmonizes well with that principle of divergence of form, which is opposed to the view that the same variety or species may have originated at different spots. It also follows that, as a general rule, the same species will not give rise to a series of similar varieties (and hence species) at different epochs; whence the geological evidence of contemporaneity derived from identity of fossil forms may be relied upon.

The most obvious cause of this limitation in area no doubt exists in the well-known fact that plants do not necessarily inhabit those areas in which they are constitutionally best fitted to thrive and to propagate; that they do not grow where they would most like to, but where they can find space and fewest enemies. We have seen (13) that most plants are at warfare with one or more competitors for the area they occupy, and that both the number of individuals of any one species and the area it covers are contingent on the conditions which determine these remaining so nicely balanced that each shall be able at least to hold its own, and not succumb to the enervating or etiolating or smothering influences of its neighbours. The effects of this warfare are to extinguish some species, to spare only the hardier races of others, and especially to limit the remainder both as to area and characters. Exceptions occur in plants suited to very limited or abnormal conditions, such as desert plants, the chief obstacles to whose multiplication are such inorganic and principally atmospheric causes as other plants cannot overcome at all; such plants have no competitors, are generally widely distributed, and not very variable.*

15. The three great classes of plants, Acotyledons, Monocotyledons, and Dicotyledons (Gymnospermous and Angiospermous), are distributed with tolerable equality over the surface of the globe, inasmuch as we cannot indicate any of the six continents (Europe, Asia, Africa, North and South America, and Australia) as being peculiarly rich in one to the exclusion of another. Further, the distribution of some of the larger Orders is remarkably equable, as *Compositæ*, *Leguminosæ*, *Gramineæ*, and others; facts which (supposing existing species to have originated in variation) would seem to indicate that the means of distribution have overcome, or been independent of the existing apparent impediments, and that the power of variation is equally distributed amongst these classes, and continuously exerted under very different conditions. I do not mean that all the classes are equally variable, but that each displays as much variety in one continent as in another.

16. Those Classes and Orders which are the least complex in organization are the most widely distributed, that is to say, they contain a larger proportion of widely diffused species. Thus the species of Acotyledons are more widely dispersed than those of Monocotyledons, and these again more so than those of Dicotyledons; so also the species of *Thallophytes* are among the most widely dispersed of Acotyledons, the *Gramineæ* of Monocotyledons, and the *Chenopodiaceæ* of Dicotyledons. This tendency of the least complex species to be most widely diffused is most marked in Acotyledons, and least so in Dicotyledons,† a fact which is analogous to that already stated (4), that the least complex are also the most variable.

* Though invariable forms, they may be, and often are, themselves varieties or races of a species that inhabits more fertile spots, as *Poa bulbosa*, which is a very well-marked and constant form of *P. pratensis*, occurring in dry sandy soil, from England to North-western India, its "meadow" relative being a very variable species in the same countries, and always struggling for existence amongst other Grasses, etc.

† Very much, no doubt, because of the difficulty in classifying Dicotyledons by complexity of organization; in other words, of our inability to estimate in a classificatory point of view the relative value of the presence or absence

17. Though we rarely find the same species running into the same varieties at widely sundered localities (unless starved or luxuriant forms be called varieties), yet we do often find a group of species represented in many distant places by other groups of allied forms; and if we suppose that individuals of the parent type have found their way to them all, the theory that existing species have originated in variation, and that varieties depart further from the parent form, will account for such groups of allied species being found at distant spots; as also for these groups being composed of representative species and genera.

18. No general relations have yet been established between the physical conditions of a country and the number of species or varieties which it contains, further than that the tropical and temperate regions are more fertile than the polar, and that perennial drought is eminently unfavourable to vegetation. It is not even ascertained whether the tropical climates produce more species than the temperate.

19. Though we cannot explain the general relations between the vegetation and physical condition of any two countries that contrast in these respects, we may conclude as a general rule that those tracts of land present the greatest variety in their vegetation that have the most varied combinations of conditions of heat, light, moisture, and mineral characters. It is, in the present state of our knowledge, impossible to measure the amount of the fluctuations of these conflicting conditions in a given country, nor if we could can we express them symbolically or otherwise so as to make them intelligible exponents of the amount of variety in the vegetation they affect; but the following facts in general distribution appear to me to be favourable to the idea that there is such a connection.

There are certain portions of the surface of the globe characterized by a remarkable uniformity in their phænogamic vegetation. These may be luxuriantly clothed, and abound in individuals, but are always poor in species. Such are the cooler temperate and subarctic lake regions of North America, Fuegia and the Falkland Islands, the Pampas of Buenos Ayres, Siberia and North Russia, Ireland and Western Scotland, the great Gangetic plain, and many other tracts of land. Now all these regions are characterized by a great uniformity in most of their physical characters, and an absence of those varying conditions which we assume to be stimulants to variation in a locality. On the other hand, it is in those tracts that have the most broken surface, varied composition of rocks, excessive climate (within the limits of vegetable endurance), and abundance of light, that the most species are found, as in South Africa, many parts of Brazil and the Andes, Southern France, Asia Minor, Spain, Algeria, Japan, and Australia.

20. The Polar regions are chiefly peopled from the colder temperate zones, and the species from the latter which have spread into them are very variable, but only within comparatively small limits, particularly in stature, colour, and vesture. Many of these polar and colder temperate plants are also found, together with other species closely allied to them, on the mountains of the warm temperate, and even tropical zones; to which it is difficult to conceive that they can have been transported by agencies now in operation.

21. The Floras of islands present many points of interest. The total number of species they contain seems to be invariably less than an equal continental area possesses, and the relative numbers of species to genera (or other higher groups) is also much less than in similar continental areas.

The further an island is from a continent, the smaller is its Flora numerically, the more

of organs in plants, where many are present, and where those of low morphological importance may have a comparatively high physiological significance.

peculiar is its vegetation, and the smaller its proportion of species to genera. In the case of very isolated islands, moreover, the generic types are often those of very distant countries, and not of the nearest land. Thus the St. Helena and Ascension forms are not so characteristic of tropical Africa as of the Cape of Good Hope. Those of Kerguelen's Land are Antarctic American, not African nor Indian. The Sandwich Islands contain many North-west American and some New Zealand forms. Japan presents us with many genera and species unknown except to the *eastward* of the Rocky Mountains, in North America.* So too American, Abyssinian, and even South African genera and species are found in Madeira and the Canary Islands; and Fuegian ones in Tristan d'Acunha.

22. There is a strict analogy in this respect between the Floras of islands and those of lofty mountain-ranges, no doubt in both cases owing to the same causes. Thus, as Japan contains various peculiar N.E. American species which are not found in N.W. America nor elsewhere on the globe, and the Canaries and Azores possess American genera not found in Europe nor Africa, so the lofty mountains of Borneo contain Tasmanian and Himalayan representatives; the Himalayas contain Andean, Rocky Mountain, and Japanese genera and species; and the alps of Victoria and Tasmania contain assemblages of New Zealand, Fuegian, Andean, and European genera and species. We cannot account for any of these cases of distribution between islands and mountains except by assuming that the species and genera common to these distant localities have found their way across the intervening spaces under conditions which no longer exist.

23. There is much to be observed in the condition and distribution of the introduced or naturalized plants of a country, which may be applied to the study of the origin of its indigenous vegetation. The greater proportion of these are the annual and other weeds of cultivated land, and plants which attach themselves to nitrogenous soils; naturalized perennials, shrubs, and trees occur consecutively in rapidly diminishing proportions. I can find no decided relation between complexity of structure and proneness to migrate, nor much between facilities for transport or power of endurance or vitality in the seed, and extent of distribution by artificial means. I shall return to this subject (which I have elsewhere discussed at length with reference to the Galapagos Archipelago†) when treating of the naturalized plants of Australia.

24. I venture to anticipate that a study of the vegetation of islands with reference to the peculiarities of their generic types on the one hand, and of their geological condition (whether as rising or sinking) on the other, may, in the present state of our knowledge, advance the subjects of distribution and variation considerably. The incompleteness of the collections at my command from the Polynesian islands, has frustrated my attempts to illustrate this branch of inquiry by extending my researches from the Australian Flora over that of the Pacific. I may however indicate as a general result, that I find the sinking islands, those (so determined by Darwin's able investigations) characterized as atolls, or as having barrier reefs, to contain comparatively fewer species and fewer peculiar generic types than those which are rising. Thus, commencing from the east coast of Africa, I find in the Indian Ocean the following islands marked in Darwin's chart‡ as bounded with fringing reefs or active volcanos, and hence rising:—The Seychelles, Madagascar, Mauritius, Bourbon, Ceylon, the Andamans, Nicobar, and Sumatra; the vegetation of all which is characterized by great diversity and much peculiarity of generic type: whereas those marked as

* Whilst these sheets are passing through the press, I have been informed by Professor Asa Gray that the Flora of Japan and N.E. Asia is much more closely allied to that of the Northern United States than to that of America west of the Rocky Mountains.

† Linn. Trans. xx. 235.

‡ See his works on volcanic islands and on coral reefs.

atolls or barrier reefs, as the Maldives, Laccadives, and Keeling Island, contain few species, and those the same as grow on the nearest continents. In the Pacific Ocean, again, the groups of islands most remarkable for their ascertained number of very peculiar generic types are the Sandwich group, Galapagos, Juan Fernandez, Loochoo and Bonin, all of which are rising, and most have active volcanos: those with the least amount of peculiarity are the Society group and Fijis, both of which are sinking. In the present state of our knowledge it is not safe to lay much stress on these apparent facts, especially as the New Hebrides and New Caledonia, which lie very close together, and both, I believe, contain much peculiarity, are in opposite geological conditions, the Hebrides rising and Caledonia sinking; and the Friendly* and Fiji groups, equally near one another, and with, I suspect, very similar vegetation, are also represented as being in opposite conditions. On the other hand, whole of the group including the Low Archipelago and the Society Islands, extending over more than 2000 miles, I observe but one rising spot,† namely, Elizabeth Island, a mere speck of land, but which is the only known habitat of one of the most remarkable genera of *Compositæ*.‡

25. Many of the above facts in the general distribution of species cannot be wholly accounted for by the supposition that natural causes have dispersed them over such existing obstacles as seas, deserts, and mountain-chains; moreover, some of these facts are opposed to the theory that the creation of existing species has taken place subsequent to the present distribution of climates, and of land and water, and to that of their dispersion having been effected by the now prevailing aquatic, atmospheric, and animal means of transport.

Similar climates and countries, even when altogether favourably placed for receiving colonists from each other, and with conditions suitable to their reciprocal exchange, do not, as a rule, interchange species. Causes now in operation will not account for the fact that only 200 of the New Zealand Flowering Plants are common to Australia, and still less for the contrasting one that the very commonest, most numerous, and universally distributed Australian genera and species, as *Casuarina, Eucalyptus, Acacia, Boronia, Helichrysum, Melaleuca*, etc., and all the Australian *Leguminosæ* (including a European genus and species), are absent from New Zealand. Causes now in operation cannot be made to account for a large assemblage of Flowering Plants characteristic of the Indian peninsula being also inhabitants of tropical Australia, while not one characteristic Australian genus has ever been found in the peninsula of India. Still less will these causes account for the presence of Antarctic and European species in the Alps of Tasmania and Victoria, or for the reappearance of Tasmanian genera on the isolated lofty mountain of Kina-Balou, in Borneo.

These and a multitude of analogous facts have led to the study of two classes of agents, both of which may be reasonably supposed to have had a powerful effect in determining the distribution of plants; these are changes of climates, and changes in the relative positions and elevations of land.

26. Of these, that most easy of direct application is the effect of humidity in extending the

* I find that there is a remarkable difference between the Floras of the New Hebrides and Caledonia on the one hand, and those of the Fiji islands and those to the east of them on the other. In the former, New Zealand and Australian types abound; in the latter, almost exclusively Indian forms. The differences between the Floras of Fiji, Samoa, Tonga, Tahiti, and that of India, are in species and not in genera, and many species are common to all.

† Mr. Darwin has left Aurora Island (another of the group) uncoloured, on account of the doubtful evidence regarding it, which however is in favour of its being in the same condition as Elizabeth Island. From a list of species communicated by Mr. Dana, it appears to contain no peculiar plants.

‡ *Fitchia.* See Lond. Journ. Bot. 1845, iv. p. 640. t. 23, 24.

range of species into regions characterized by what would otherwise be to them destructive temperatures.

I have, in the 'Antarctic Flora,' shown that the distribution of tropical forms is extended into cold regions that are humid and equable further than into such as are dry and excessive; and, conversely, that temperate forms advance much further into humid and equable tropical regions than into dry and excessive ones; and I have attributed the extension of Tree-ferns, Epiphytal Orchids, Myrtaceæ, etc., into high southern latitudes, to the moist and equable climate of the south temperate zone. I have also shown how conspicuously this kind of climate influences the distribution of mountain plants in India, where tropical forms of Laurel, Fig, Bamboo, and many other genera, ascend the humid extratropical mountains of Eastern Bengal and Sikkim to fully 9000 feet elevation; and temperate genera, and in some cases species, of Quercus, Salix, Rosa, Pinus, Prunus, Camellia, Rubus, Kadsura, Fragaria, Æsculus, etc., descend the mountains even to the level of the sea, in lat. 25°. In a tropical climate the combined effects of an equable climate and humidity in thus extending the distribution of species, often amount to 5000 feet in elevation or depression (equivalent to 15° Fahr. of isothermals in latitude), a most important element in our speculations on the comparative range of species under existing or past conditions; and when to this is added that the average range in altitude of each Himalayan tropical and temperate and alpine species of Flowering Plant is 4000 feet, which is equivalent to 12° of isothermals of latitude, we can understand how an elevation of a very few thousand feet might, under certain climatic conditions, suffice to extend the range of an otherwise local species over at least 25° parallels of latitude, and how a proportionally small increase of elevation in a meridional chain where it crosses the Equator, may enable temperate plants to effect an easy passage from one temperate zone to the other.

27. To explain more fully the present distribution of species and genera in area, I have recourse to those arguments which are developed in the Introductory Essay to the New Zealand Flora, and which rest on geological evidence, originally established by Sir Charles Lyell, that certain species of animals have survived great relative changes of sea and land. This doctrine, which I in that Essay endeavoured to expand by a study of the distribution of existing Southern species, has, I venture to think, acquired additional weight since then, from the facts I shall bring forward under the next head of Geological Distribution, and which seem to indicate that many existing Orders and Genera of plants of the highest development may have flourished during the Eocene and Cretaceous periods, and have hence survived complete revolutions in the temperature and geography of the middle and temperate latitudes of the globe.

28. Mr. Darwin has greatly extended in another direction these views of the antiquity of many European species, and their power of retaining their *facies* unchanged during most extensive migrations, by his theory of the simultaneous extension of the glacial temperature in both hemispheres, and its consequent effect in cooling the tropical zone. He argues that, under such a cold condition of the surface of the globe, the temperate plants of both hemispheres may have been almost confined to the tropical zone, whence afterwards, owing to an increment of temperature, they would be driven up the mountains of the tropics, and back again to those higher temperate latitudes where we now find most of them. I have already (New Zealand Essay) availed myself of the hypothesis of an austral glacial period, to account for Antarctic species being found on the alps of Australia, Tasmania, and New Zealand; and if as complete evidence of such a proportionally cooled state of the intertropical regions were forthcoming as there is of a glacial condition of the temperate zones, it would amply suffice to account for the presence of European and Arctic species in the Antarctic and south tem-

perate regions, and of the temperate species of both hemispheres on the mountains of intermediate tropical latitudes.

On the other hand, we have sufficient evidence of many of what are now the most tropical Orders of plants having inhabited the north temperate zone before the glacial epoch; and it is difficult to conceive how these Orders could have survived so great a reduction of the temperature of the globe as should have allowed the preglacial temperate Flora to cross the Equator in any longitude. It is evident that, under such cold, the most tropical Orders must have perished, and their re-creation after the glacial epoch is an inadmissible hypothesis.*

29. It remains then to examine whether, supposing the glacial epochs of the northern and southern hemispheres to have been contemporaneous, the relations of land and sea may not have been such as that a certain meridian may have retained a tropical temperature near the Equator, and thus have preserved the tropical forms. Such conditions might perhaps be attained by supposing two large masses of land at either pole, which should contract and join towards the Equator, forming one meridional continent, while one equatorial mass of land should be placed at the opposite meridian. If the former continent were traversed by a meridional chain of mountains, and so disposed that the polar oceanic currents should sweep towards the Equator for many degrees along both its shores, its equatorial climate would be throughout far more temperate than that of the opposite equatorial mass of land, whose climate would be tropical, insular, and humid.

30. The hypothesis of former mountain chains having afforded to plants the means of migration, by connecting countries now isolated by seas or desert plains, is derived from the evidence afforded by geology of the extraordinary mutation in elevation that the earth's surface has experienced since the appearance of existing forms of animals and plants. In the Antarctic Flora I suggested as an hypothesis that the presence of so many Arctic-American plants in Antarctic America might be accounted for by supposing that the now depressed portions of the Andean chain had, at a former period, been so elevated that the species in question had passed along it from the north to the south temperate zone;† and there are some facts in the distribution of species common to the mountain Floras of the Himalaya and Malay Islands, and of Australia and Japan, that would well accommodate themselves to a similar hypothesis. Of such submerged meridional lands we have some slender

* The question of the state of the mean temperature of the globe during comparatively recent geological periods is yearly deriving greater importance in relation to the problem of distribution. Upon this point geologists are not altogether clear, nor at one with the masters of physical science. Lyell (Principles, ed. ix. chap. vii.) attributes the glacial epoch to such a disposition of land and sea as would sufficiently cool the temperate zones; and he implies that this involves or necessitates a lowering of the mean temperature of the whole globe. Another hypothesis is, that there was a lowering of the mean temperature of the globe wholly independent of any material change in the present relations of sea and land, which cold induced the glacial epoch. A third theory is that such a redisposition of land and sea as would induce a glacial epoch in our hemisphere need not be great, nor necessitate a decrement of the mean temperature of the whole earth.

† The continuous extension of so many species along the Cordillera (of which detailed evidence is given in the Antarctic Flora) from the Rocky Mountains to Fuegia, is a most remarkable fact, considering how great the break is between the Andes of New Granada and those of Mexico, and that the intermediate countries present but few resting-places for alpine plants. That this depression of the chain has had a powerful effect in either limiting the extension of species which have appeared since its occurrence, or in inducing changes of climate which have extinguished species once common to the north and south, is evidenced by the fact that a number of Fuegian and South Chili plants extend northward as alpines to the very shores of the Gulf of Mexico, but do not inhabit the Mexican Andes, whilst as many Arctic species advance south to the Mexican Andes, but do not cross the intermediate depression and reappear in the Bolivian Andes.

evidence in the fact that, in the meridians of Australia and Japan, we have, first, the north-west coast of Australia sinking, together with the Louisiade Archipelago to its north; then, approaching the Line, the New Ireland group is sinking, as are also the Caroline Islands, in lat. 7° N. Beyond this, however, in lat. 15° N., are the Marianne Islands (rising), of whose vegetation nothing is known; in 27° N., the Bonin Islands (also rising); and in 30° N. is Japan, with which this botanical relationship exists.

It is objected by Mr. Darwin to this line of argument (as to that at p. xv concerning the Pacific Islands), that all these sinking areas are volcanic islands, having no traces of older rocks on them; but I do not see that this altogether invalidates the hypothesis, for many of the loftiest mountains throughout the Malayan Archipelago, New Zealand, and the Pacific Islands, are volcanic; some are active, and many attain 10–14,000 feet in elevation, whilst the lower portions of some of the largest of these islands are formed of rocks of various ages.

§ 4.

On the General Phenomena of the Distribution of Plants in Time.

A third class of facts relates to the antiquity of vegetable forms and types on the globe, as evidenced by fossil plants. The chief facts relating to these are the following:—

31. The earliest Flora of which we know much scientifically, is that of the Carboniferous formation. We have indeed plants that belonged to an earlier vegetation, but they do not differ in any important respects from those of the carboniferous formation.

Now the ascertained features of the coal vegetation may be summed up very briefly. There existed at that time,—

Filices; in the main entirely resembling their modern representatives, and some of which may even be generically, though not specifically, identical with them.

Lycopodiaceæ; the same in their main characters as those now existing, and, though of higher specialization of stem, of greater stature, of different species, and perhaps also genera, from modern *Lycopodiaceæ*, yet identical with these in the structure of their reproductive organs and their contents, and in the minute anatomy of their tissues.

Coniferæ. The evidence of this Order is derived chiefly from the anatomical characters of the Dicotyledonous wood so abundantly found in the coal, and which seems to be identical in all important respects with the wood of modern genera of that Order, to which must be added the probability of *Trigonocarpon* and *Nœggerathia* being Gymnospermous, and allied to *Salisburia*.* On the other hand, it must not be overlooked that no Coniferous strobili have been hitherto detected in the Carboniferous formation.

Cycadeæ. Some fragments of wood, presenting a striking similarity in anatomical characters to that of *Cycadeæ*, have been found in the carboniferous series.

In the absence of the fructification of *Calamites*, *Calamodendron*, *Halonia*, *Anabathra*, etc., there are no materials for any safe conclusions as to their immediate affinities, beyond that they all seem to be allied to Ferns or *Lycopodiaceæ;* but the same can hardly be said of the affinities of *Volkmannia*,† *Antholithes* and others, which have been referred, with more or less probability, to Angiospermous Dicotyledons.

The Permian Flora is for the most part specifically distinct from the Carboniferous, but many of

* Phil. Trans. 1855, p. 149. † See Quarterly Journal of Geological Society, May, 1854.

its genera are the same. The prevalent types are Gymnospermous Dicotyledons, especially *Cycadeæ*, and a great abundance of Tree-ferns.

The New Red Sandstone, or Trias group, presents plants more analogous to those of the Oolite than to those of the Carboniferous epoch, but they have also much in common with the latter. *Voltzia*, a remarkable genus of Conifers, appears to be peculiar to this period.

In the Lias numerous species of *Cycadeæ* have been found, with various Conifers and many Ferns. No other Dicotyledonous or any Monocotyledonous plants have as yet been discovered, but it is difficult to believe that none such should have existed at a period when wood-boring and herb-devouring insects, belonging to modern genera, were extremely abundant, as has been proved by the researches of Mr. Brodie and Mr. Westwood.*

The Oolite contains numerous *Cycadeæ*, *Coniferæ*, and Ferns, and more herbivorous genera of insects; and here Monocotyledonous vegetables are recognizable in *Podocarya* and other Pandaneous plants. A cone of *Pinus* has been discovered in the Purbeck, and one of *Araucaria* in the inferior Oolite of Somersetshire.

In the Cretaceous group, Dicotyledons of a very high type appear. A good many species are enumerated† by Dr. Debey, of Aix-la-Chapelle, including a species of *Juglans*, a genus belonging to an Order of highly-developed floral structure and complex affinities.‡

Characeæ appear for the first time at this epoch, and are apparently wholly similar in structure to those of the present day.

The Tertiary strata present large assemblages of plants of so many existing Genera and Orders, that it can hardly be doubted but that even the earliest Flora of that period was almost as complex and varied as that of our own. In the lowest Eocene beds are found *Anonaceæ*, *Nipa*, *Acacia*, and *Cucurbitaceæ*.§ In the Bagshot sands some silicified wood has been found, which may confidently be referred to *Banksia*, and which is, in fact, scarcely distinguishable from recent and fossil Australian Banksia wood.‖

* These insects include species of the existing common European genera, *Elater*, *Gryllus*, *Hemerobius*, *Ephemera*, *Libellula*, *Panorpa*, and *Carabus*. Of all conspicuous tribes of plants the *Cycadeæ*, *Filices*, *Coniferæ*, and *Lycopodiaceæ* perhaps support the fewest insects, and the association of the above-named insects with a vegetation consisting solely or mainly of plants of these Orders is quite inconceivable.

† Quart. Journ. Geol. Soc. vii. pt. 1. misc. p. 110.

‡ Professor Oswald Heer, of Zurich, in an interesting little paper (Quelques Mots sur les Noyers), in Bibl. Univ. Genev. Sep. 1858, argues from the fact of the early appearance of *Juglans* in the geological series, that this genus must be a low type of the Dicotyledonous class to which it belongs. The position of *Juglans* is unsettled in the present state of our classification of Dicotyledonous Orders, as it has equal claims to be ranked with *Terebinthaceæ*, which are very high in the series, and with *Cupuliferæ*, which are placed very low; and were the grounds for our thus ranking these Orders based on characters of ascertained relative value, such an argument might be admissible; but the system which sunders these Orders is a purely artificial one, and *Juglans* with its allies would prove it so, if other proofs were wanting; for it absolutely combines *Terebinthaceæ* and *Cupuliferæ* into one natural group, in which (as in so many others) there is a gradual passage from great complexity of floral organs to great simplicity.

§ I am far from considering the identification of these and the other genera which I have enumerated in various strata as satisfactory, but I conclude that they may be taken as evidence of as highly developed and varied plants having then existed as are now represented by these genera.

‖ I am indebted to the late Robert Brown for this fact, and for the means of comparing the specimens, which are beautifully opalized. I ascertained that he was satisfied with the evidence of this wood having really been dug up near Staines, though it is so perfectly similar in every respect to the opalized Banksia-wood of Tasmania as to suggest to his mind and my own the most serious doubts as to its English origin.

In the brown coal of the Eocene and Miocene periods, Fan-palms, Conifers, and various existing genera of *Myriceæ*, *Laurineæ*, and *Plataneæ* are believed to have been identified. Wesel and Weber describe from the brown coal of the Rhine a rich and varied Flora, representing numerous families never now seen associated, and including some of the peculiar and characteristic genera of the Australian, South African, American, Indian, and European Floras.*

In the Mollasse and certain Miocene formations at Œningen and elsewhere in Germany, Switzerland, and Tuscany,† 900 species of Dicotyledons‡ have been observed, all apparently different from existing ones. They have been referred, with more or less probability, to Fan-palms, Poplars (three species), evergreen *Laurineæ*, *Ceratonia*, *Acacia*, *Tamarindus*, *Banksia*, *Embothrium*, *Grevillea*, *Cupressus*, several species of *Juglans* (one near the North-American *J. acuminata*, another near the common Walnut of Europe and Asia, *J. nigra*, and a third near the North-American *J. cinerea*); also a Hickory, near the *Carya alba* (a genus now wholly American), and a *Pterocarya* closely allied to *P. Caucasica*.

The rise of the Alps was subsequent to this period; and in the European deposits immediately succeeding that event, in Switzerland (at Durnten and Utznach) are found evidences of the following existing species,—Spruce, Larch, Scotch Fir, Birch, a Hazel (different from that now existing), ***Scirpus lacustris, Phragmites communis,*** and ***Menyanthes trifoliata.***

The glacial epoch followed, during and since which there has probably been little generic change in the vegetation of the globe.

32. So much for the main facts hitherto regarded as established in Vegetable Palæontology; they are of little value as compared with those afforded by the Animal Kingdom, even granting that they are all well made out, which is by no means the case. In applying them theoretically to the solution of the question of creation and distribution, the first point which strikes us is the impossibility of establishing a parallel between the successive appearances of vegetable forms in time, and their complexity of structure or specialization of organs, as represented by the successively higher groups in the Natural method of classification. Secondly, that the earliest recognizable Cryptogams

* See Quart. Journ. Geol. Soc. xv. misc. 3, where an abstract is given, with some excellent cautions, by C. J. F. Bunbury, Esq. The Australian genera include *Eucalyptus*, *Casuarina*, *Leptomeria*, *Templetonia*, *Banksia*, *Dryandra*, and *Hakea*. I am not prepared to assert that these identifications, or the Australian ones of the Mollasse, are all so unsatisfactory that the evidence of Australian types in the brown coal and Mollasse should be altogether set aside; but I do consider that not one of the above-named genera is identified at all satisfactorily, and that many of them are not even problematically decided.

† During the printing of this sheet I have received from my friend M. De Candolle a very interesting memoir on the tertiary fossil plants of Tuscany, by M. C. Gaudin and the Marquis C. Strozzi, in which some of the genera here alluded to are described. The age of these Tuscan beds is referred by Prof. O. Heer to a period intermediate between those of Utznach and Œningen. The most important plants described are, Coniferæ, 6 sp.; Salix, 2; Liquidambar, 1; Almus, 1; Carpinus, 1; Populus, 2; Fagus, 1; Quercus, 5; Ulmus, 2; Planera, 1; Ficus, 1; Platanus, 1; Oreodaphne, 1; Laurus, 2; Persea, 1; Acer, 2; Vitis, 1; Juglans, 4; Carya, 1; Pterocarya, 1. There are 49 extinct species in all, of which 46 are referred, without even a mark of doubt or caution, to existing genera, and this in almost all cases from imperfect leaves alone! Without questioning the good faith or ability of the authors of this really valuable and interesting memoir, I cannot withhold my protest against this practice of making what are at best little better than surmises, appear under the guise of scientifically established identifications. What confidence can be placed in the positive reference of supposed fossil Fungi to *Sphæria*, or of pinnated leaves to *Sapindus*, and other fragments of foliage to existing genera of *Laurineæ*, *Ficus*, and *Vitis?*

‡ O. Heer, Sur les Charbons feuilletés de Durnten et Utznach, in Mem. Soc. Helvet. Sc. Nat. 1857; Bibl. Univers. Genev. August, 1858.

should not only be the highest now existing, but have more highly differentiated vegetative organs than any subsequently appearing; and that the dicotyledonous embryo and perfect exogenous wood with the highest specialized tissue known (the coniferous, with glandular tissue*), should have preceded the monocotyledonous embryo and endogenous wood in date of appearance on the globe, are facts wholly opposed to the doctrine of progression, and they can only be set aside on the supposition that they are fragmentary evidence of a time further removed from that of the origin of vegetation than from the present day; to which must be added the supposition that types of *Lycopodiaceæ*, and a number of other Orders and Genera, as low as those now living, existed at that time also.

Another point is the evidence,† said to be established, of genera now respectively considered peculiar to the five continents having existed cotemporaneously at a comparatively recent geological epoch in Europe, and the very close affinity, if not identity, of some of these with existing species. The changes in the level and contour of the different parts of the earth's surface which have occurred since the period of the chalk, or even since that preceding the rise of the Alps, imply a very great amount of difference between the past and present relations of sea and land and climate; and it is no doubt owing to these changes that the *Araucariæ*, which once inhabited England, are no longer found in the northern hemisphere, and that the Australian genera which inhabited Europe at a period preceding the rise of the Alps have since been expelled.

Such facts, standing at the threshold of our knowledge of vegetable palæontology, should lead us to expect that the problem of distribution is an infinitely complicated one, and suggest the idea that the mutations of the surface of our planet, which replace continents by oceans, and plains by mountains, may be insignificant measures of time when compared with the duration of some existing genera and perhaps species of plants, for some of these appear to have outlived the slow submersion of continents.

35. From the sum then of our theories, as arranged in accordance with ascertained facts, we may make the following assumptions:—That the principal recognized families of plants which inhabited the globe at and since the Palæozoic period still exist, and therefore have as families survived all intervening geological changes. That of these types some have been transferred, or have migrated, from one hemisphere to another. That it is not unreasonable to suppose that further evidence may be forthcoming which will show that all existing species may have descended genealogically from fewer pre-existing ones; that we owe their different forms to the variation of individuals, and the power of limiting them into genera and species to the destruction of some of these varieties, etc., and the increase in individuals of others. Lastly, that the fact of species being with so much uniformity the ultimate and most definable group (the leaves as it were of the family tree), may possibly be owing to the tendency to vary being checked, partly by the ample opportunities each brood of a

* The vexed question of the true position of Gymnospermous plants in the Natural System assumes a somewhat different aspect under the view of species being created by progressive evolution. In the haste to press the recent important discoveries in vegetable impregnation and embryogeny into the service of classification, the long-established facts regarding the development of the stem, flower, and reproductive organs themselves of Gymnospermous plants have been relatively underrated or wholly lost sight of; and if an examination of the doctrines of progression and variation lead to a better general estimation of the comparative value of the characters presented by these organs, the acceptance or rejection of the doctrines themselves is, in the present state of science, a matter of secondary importance.

† See first foot-note of p. xxi (*): what I have there said of the supposed identifications of the Australian genera applies to many of those of the other enumerated quarters of the globe.

variety possesses of being fertilized by the pollen of its nearest counterpart, partly by the temporary stability of its surrounding physical conditions, and partly by the superabundance of seeds shed by each individual, those only vegetating which are well suited to existing conditions: an appearance of stability is also, in the case of many perennials, due to the fact that the individuals normally attain a great age,* and thus survive many generations of other species, of which generations some present characters foreign to their parents.

36. In the above line of argument I have not alluded to the question of the origin of those families of plants which appear in the earliest geological formations, nor to that of vegetable life in the abstract, conceiving these to be subjects upon which, in the present state of science, botany throws no light whatever. Regarded from the classificatory point of view, the geological history of plants is not altogether favourable to the theory of progressive development, both because the earliest ascertained types are of such high and complex organization,† and because there are no known fossil plants which we can certainly assume to belong to a non-existing class or even family, nor that are ascertained to be intermediate in affinity between recent classes or families.‡

The progress of investigation may ultimately reveal the true history of the unrecognized vegetable remains with which our collections abound, and may discover to us amongst them new and unexpected organisms, suggesting or proving a progressive development; but in the meantime the fact remains that the prominent phenomena of vegetable palæontology do not advance us one step towards a satisfactory conception of the first origin of existing Natural Orders of plants.

Taking the Conifers as an example, whatever rank is given to them by the systematist, that they should have preceded Monocotyledons and many Dicotyledons in date of appearance on the globe, is a fact quite incompatible with progressive development in the scientific acceptation of the term, whilst to argue from their apparently early appearance that they are low in a classificatory system is begging the question.

Another fact to be borne in mind is, that we have no accurate idea of what systematic progression is in botany. We know little of high and low in the Vegetable Kingdom further than is expressed by the sequence of the three classes, Dicotyledons, Monocotyledons, and Acotyledons; and amongst Acotyledons, of Thallogens being lower than Acrogens, and of these that the Mosses, etc., are lower than Filices and their allies. It is true that we technically consider multiplication and complexity of floral whorls in phænogamic plants as indications of superior organization; but very many

* In considering the relative amount and rate at which different plants vary, it should be remembered that we habitually estimate them not only loosely but falsely. We assume annuals to be more variable than perennials, but we probably greatly overrate the amount to which they really are so, because a brief personal experience enables us to study many generations of an annual under many combinations of physical conditions; whereas the same experience embraces but a fractional period of the duration of (comparatively) very few perennials. It has also been well shown by Bentham (in his paper on the British Flora, read (1858) before the Linnæan Society) that an appearance of stability is given to many varieties of perennials, through their habitual increase by buds, offsets, etc., which propagate the individual; and in the case of *Rubi*, which comparatively seldom propagate by seed, a large tract of ground may be peopled by parts of a single individual.

† I have elsewhere stated that I consider the evidence of *Algæ* having existed at a period preceding vascular Cryptogams to be of very little value. (Lond. Journ. Bot. viii. p. 254.)

‡ It must not be supposed that in saying this I am even expressing a doubt as to there having been plants intermediate in affinity between existing Orders and Classes. Analogy with the animal kingdom suggests that some at any rate of the plants of the coal epoch do hold such a relationship; but should they not do so, I consider this fact to be of little value in the present inquiry, for I incline to believe that the ascertained geological history of plants embraces a mere fraction of their whole history.

of the Genera and Orders most deficient in these respects are so manifestly reduced members of others, which are indisputably the most complex in organization in the whole Vegetable Kingdom, that no good classification even has been founded on these considerations alone.*

37. Again, it is argued by both Mr. Darwin and Mr. Wallace that the general effects of variation by selection must be to establish a general progressive development of the whole animal kingdom. But here again in botany we are checked by the question, What is the standard of progression? Is it physiological or morphological? Is it evidenced by the power of overcoming physical obstacles to dispersion or propagation, or by a nice adaptation of structure or constitution to very restricted or complex conditions? Are cosmopolites to be regarded as superior to plants of restricted range, hermaphrodite plants to unisexual, parasites to self-sustainers, albuminous-seeded to exalbuminous, gymnosperms to angiosperms, water plants to land, trees to herbs, perennials to annuals, insular plants to continental? and, in fine, what is the significance of the multitudinous differences in point of structure and complexity, and powers of endurance, presented by the members of the Vegetable Kingdom, and which have no recognized physiological end and interpretation, nor importance in a classificatory point of view? It is extremely easy to answer any of these questions, and to support the opinion by a host of arguments, morphological, physiological, and teleological; but any one gifted with a quick perception of relations, and whose mind is stored with a sufficiency of facts, will turn every argument to equal advantage for both sides of the question.

To my mind, however, the doctrine of progression, if considered in connection with the hypothesis of the origin of species being by variation, is by far the most profound of all that have ever agitated the schools of Natural History, and I do not think that it has yet been treated in the unprejudiced spirit it demands. The elements for its study are the vastest and most complicated which the naturalist can contemplate, and reside in the comprehension of the reciprocal action of the so-called inorganic on the organic world. Granting that multiplication and specialization of organs is the evidence and measure of progression, that variation explains the *rationale* of the operation which results in this progression, the question arises, What are the limits to the combinations of physical causes which determine this progression, and how can the specializing power of Nature stop short of causing every race or family ultimately to represent a species? While the psychological philosophers persuade us that we see the tendency to specialize pervading every attribute of organic life, mental and physical; and the physicists teach that there are limits to the amount and duration of heat, light, and every other manifestation of physical force which our senses present or our intellects perceive, and which are all in process of consumption; the reflecting botanist, knowing that his ultimate results must accord with these facts, is perplexed at feeling that he has failed to establish on independent evidence the doctrines of variation and progressive specialization, or to co-ordinate his attempts to do so with the successive discoveries in physical science.

* The subject of the retrogression of types has never yet been investigated in botany, nor its importance estimated in inquiries of this nature. To whatever Order we may grant the dignity of great superiority or complexity, we find that Order containing groups of species of very simple organization; these are moreover often of great size and importance, and of wide geographical distribution. Such groups, if regarded *per se*, appear to be far lower in organization than other groups which are many degrees below them in the classified series; and our only clue to their real position is their evident affinity with their complex co-ordinates;—destroy the latter by a geological or other event, and all clue to the real position of the former may be lost. Are such groups of simply-constructed species created by retrogressive variation of the higher, or did the higher proceed from them by progressive variation? If the latter, did the simpler forms precede in origin the highest forms of all other groups which rank below them in the classified series?

38. Before dismissing this subject, I may revert once more to the opposite doctrine, which regards species as immutable creations, and this principally to observe that the arguments in its favour have neither gained nor lost by increased facilities for investigation, or by additional means for observation. The facts are unassailable that we have no direct knowledge of the origin of any wild species; that many are separated by numerous structural peculiarities from all other plants; that some of them invariably propagate their like; and that a few have retained their characters unchanged under very different conditions and through geological epochs. Recent discoveries have not weakened the force of these facts, nor have successive thinkers derived new arguments from them; and if we hence conclude from them that species are really independent creations and immutable, though so often illimitable, then is all further inquiry a waste of time, and the question of their origin, and that of their classification in Genera and Orders, can, in the present state of science, never be answered, and the only known avenues to all means of investigation must be considered as closed till the origin of life itself is brought to light.

39. Of these facts the most important, and indeed the only one that affords a tangible argument, is that of genetic resemblance. To the tyro in Natural History all similar plants may have had one parent, but all dissimilar plants must have had dissimilar parents. Daily experience demonstrates the first position, but it takes years of observation to prove that the second is not always true. There are, further, certain circumstances connected with the pursuit of the sciences of observation which tend to narrow the observer's views of the attributes of species; he begins by examining a few individuals of many extremely different kinds or species, which are to him fixed ideas, and the relationships of which he only discovers by patient investigation; he then distributes them into Genera, Orders, and Classes, the process usually being that of reducing a great number of dissimilar ideas under a few successively higher general conceptions; whilst with the history of the ideas themselves, that is, of species, he seldom concerns himself. In a study so vast as botany, it takes a long time for a naturalist to arrive at an accurate knowledge of the relations of Genera and Orders if he aim at being a good systematist, or to acquire an intimate knowledge of species if he aim at a proficiency in local Floras, and in both these pursuits the abstract consideration of the species itself is generally lost sight of; the systematist seldom returns to it, and the local botanist, who finds the minutest differences to be hereditary in a limited area, applies the argument derived from genetic resemblance to every hereditarily distinct form.

40. It has been urged against the theory that existing species have arisen through the variation of pre-existing ones and the destruction of intermediate varieties, that it is a hasty inference from a few facts in the life of a few variable plants, and is therefore unworthy of confidence, if not of consideration; but it appears to me that the opposite theory, which demands an independent creative act for each species, is an equally hasty inference from a few negative facts in the life of certain species,* of which some generations have proved invariable within our extremely limited experience. These theories must not, however, be judged of solely by the force of the very few absolute facts on which they are based; there are other considerations to be taken into account, and especially the conclusions to which they lead, and their bearing upon collateral biological phenomena, under which points of view the theory of independent creations appears to me to be greatly at a disadvantage; for according to it every fact and every phenomenon regarding the origin and continuance of species, but that of their occasional variation, and their extinction by natural causes, and regarding the *rationale* of classi-

* See paragraph 4, where I have stated that the grand total of unstable species probably exceeds that of the stable.

fication, is swallowed up in the gigantic conception of a power intermittently exercised in the development, out of inorganic elements, of organisms the most bulky and complex as well as the most minute and simple; and the consanguinity of each new being to its pre-existent nearest ally, is a barren fact, of no scientific significance or further importance to the naturalist than that it enables him to classify. The realization of this conception is of course impossible; the boldest speculator cannot realize the idea of a highly organized plant or animal starting into life within an area that has been the field of his own exact observation* and research; whilst the more cautious advocate hesitates about admitting the origin of the simplest organism under such circumstances, because it compels his subscribing to the doctrine of the "spontaneous generation" of living beings of every degree of complexity in structure and refinement of organization.

On the other hand, the advocate of creation by variation may have to stretch his imagination to account for such gaps in a homogeneous system as will resolve its members into genera, classes, and orders; but in doing so he is only expanding the principle which both theorists allow to have operated in the resolution of some groups of individuals into varieties: and if, as I have endeavoured to show, all those attributes of organic life which are involved in the study of classification, representation, and distribution, and which are barren facts under the theory of special creations, may receive a rational explanation under another theory, it is to this latter that the naturalist should look for the means of penetrating the mystery which envelopes the history of species, holding himself ready to lay it down when it shall prove as useless for the further advance of science, as the long serviceable theory of special creations, founded on genetic resemblance, now appears to me to be.

The arguments deduced from genetic resemblance being (in the present state of science), as far as I can discover, exhausted, I have felt it my duty to re-examine the phenomena of variation in reference to the origin of existing species; these phenomena I have long studied independently of this question, and when treating either of whole Floras or of species, I have made it my constant aim to demonstrate how much more important and prevalent this element of variability is than is usually admitted, as also how deep it lies beneath the foundations of all our facts and reasonings concerning classification and distribution. I have hitherto endeavoured to keep my ideas upon variation in subjection to the hypothesis of species being immutable, both because a due regard to that theory checks any tendency to careless observation of minute facts, and because the opposite one is apt to lead to a precipitate conclusion that slight differences have no significance; whereas, though not of specific importance, they may be of high structural and physiological value, and hence reveal affinities that might otherwise escape us. I have already stated how greatly I am indebted to Mr. Darwin's† *rationale* of the phenomena of variation and natural selection in the production of species; and though it does not positively establish the doctrine of creation by variation, I expect that every additional fact and observation relating to species will gain great additional value from being viewed in reference to it, and that it will materially assist in developing the principles of classification and distribution.

* It is a curious fact (illustrative of a well-known tendency of the mind), that the few writers who have in imagination endeavoured to push the doctrine of special creations to a logical issue, either place the scene of the creative effort in some unknown, distant, or isolated corner of the globe, removed far beyond the ken of scientific observation, or suppose it to have been enacted at a period when the physical conditions of the globe differed both in degree and kind from what now obtain; thus in both cases arguing *ad ignotum ab ignoto*.

† In this Essay I refer to the brief abstract only (Linn. Journ.) of my friend's views, not to his work now in the press, a deliberate study of which may modify my opinion on some points whereon we differ. Matured conclusions on these subjects are very slowly developed.

ON THE FLORA OF AUSTRALIA.

§ 1.

General Remarks.

The Flora of Australia has been justly regarded as the most remarkable that is known, owing to the number of peculiar forms of vegetation which that continent presents. So numerous indeed are the peculiarities of this Flora, that it has been considered as differing fundamentally, or in almost all its attributes, from those of other lands; and speculations have been entertained that its origin is either referable to another period of the world's history from that in which the existing plants of other continents have been produced, or to a separate creative effort from that which contemporaneously peopled the rest of the globe with its existing vegetation; whilst others again have supposed that the climate or some other attribute of Australia has exerted an influence on its vegetation, differing both in kind and degree from that of other climates. One of my objects in undertaking a general survey of the Australian Flora, has been to test the value of the facts which have given rise to these speculations, and to determine the extent and comparative value of a different and larger class of facts which are opposed to them, and which might also give some clue to the origin of the Flora, and thus account for its peculiarities. This I pursued under the impression that it is the same with the study of whole Floras as of single species or their organs, viz. that it is much easier to see peculiarities than to appreciate resemblances, and that important general characters which pervade all the members of a family or Flora, are too often overlooked or undervalued, when associated with more conspicuous differences which enable us to dismember them. The result has proved, as I anticipated, that, the great difficulty being surmounted of collecting all the materials and so classifying them as to allow of their being generalized upon, the peculiarities of the Flora, great though they be, are found to be more apparent than real, and to be due to a multitude of specialities affecting the species, and to a certain extent the genera, but not extending to the more important characteristics of the vegetation, which is not fundamentally different from that of other parts of the globe.

Before proceeding to the discussion of the elements of the Australian Flora, I shall shortly describe its general character, viewed in the double light of a peculiar vegetation and as a part of the existing Flora of the globe. Its chief peculiarities are:—

That it contains more genera and species peculiar to its own area, and fewer plants belonging to other parts of the world, than any other country of equal extent. About two-fifths of its genera, and upwards of seven-eighths of its species are entirely confined to Australia.

Many of the plants have a very peculiar habit or physiognomy, giving in some cases a character to the forest scenery (as *Eucalypti*, *Acaciæ*, *Proteaceæ*, *Casuarinæ*, *Coniferæ*), or are themselves of anomalous or grotesque appearance (as *Xanthorrhœa*, *Kingia*, *Delabechea*, *Casuarina*, *Banksia*, *Dryandra*, etc.).

A great many of the species have anomalous organs, as the pitchers of *Cephalotus*, the deciduous bark and remarkable vertical leaves of the *Eucalypti*, the phyllodia of *Acacia*, the fleshy peduncle of *Exocarpus*, the inflorescence and ragged foliage of many *Proteaceæ*.

Many genera and species display singular structural peculiarities, as the ovules of *Banksia*,

calyptra of *Eucalyptus*, stigma of *Goodeniaceæ*, staminal column of *Stylidium*, irritable labellum of various *Orchideæ*, flowers sunk in the wood of some *Leptospermeæ*, pericarp of *Casuarina*, receptacle and inner staminodia of *Eupomatia*, stomata of *Proteaceæ*.

On the other hand, if, disregarding the peculiarities of the Flora, I compare its elements with those of the Floras of similarly situated large areas of land, or with that of the whole globe, I find that there is so great an agreement between these, that it is impossible to regard Australian vegetation in any other light than as forming a peculiar, but not an aberrant or anomalous, botanical province of the existing Vegetable Kingdom. I find :—

That the relative proportions of the great classes of Monocotyledons to Dicotyledons, of genera to orders, and of species to genera, are the same as those which prevail in other Floras of equal extent.

That the subclasses distinguished by a greater or less complexity of the floral envelopes, or their absence, as *Thalamifloræ, Calycifloræ, Corollifloræ*, etc., are also in the same relative proportions as prevail in other Floras.

That the proportion of Gymnospermous plants to other Dicotyledons is not increased.

That all the Australian Natural Orders, with only two small exceptions, are also found in other countries ; that most of those most widely diffused in Australia are such as are also the most widely distributed over the globe ; and that Australia wants no known Order of general distribution.

That the only two absolutely peculiar Natural Orders contain together only three genera, and very few species ; they are, further, comparatively local in Australia, and are rather aberrant forms of existing natural families than well-marked isolated groups : *Brunoniaceæ* being intermediate between *Goodeniaceæ* and *Compositæ*, and *Tremandreæ* between *Polygaleæ* and *Buettneriaceæ*.

That the large Natural Orders and Genera, which, though not absolutely restricted to Australia, are there very abundant in species and rare elsewhere, and for which I shall hence adopt the term Australian, stand in very close relationship to groups of plants which are widely spread over the globe (as *Epacrideæ* to *Ericeæ*, *Goodeniaceæ* to *Campanulaceæ*, *Stylideæ* to *Lobeliaceæ*, *Casuarinæ* to *Myricæ*).

That these Australian Orders are exceedingly unequally distributed in Australia ; that there is a greater specific difference between two quarters of Australia (south-eastern and south-western) than between Australia and the rest of the globe ; and that the most marked characteristics of the Flora are concentrated at that point which is geographically most remote from any other region of the globe.

That most of those Australian Orders and genera which are found in other countries around Australia, have their maximum development in Australia at points approximating in geographical position towards those neighbouring countries. Thus the peculiarly Indian features of the Flora are most developed in north-western Australia, the Polynesian and Malayan in north-eastern, the New Zealand and South American in south-eastern, and the South African in south-western Australia.

That of the nine largest Natural Orders, which together include a moiety of the Australian species of flowering plants, no fewer than six belong to the nine largest Natural Orders of the whole world, and five belong to the largest in India also.

That in Australia itself, in advancing from the tropics to the coldest latitudes, or from the driest to the most humid districts, or from the interior to the seashore, or in ascending the mountains, the changes in vegetation are in every aspect analogous to what occur in other parts of the globe.

That the relations between the epochs of the flowering and the fruiting of plants, and the seasons of the year, are the same in Australia as elsewhere, and most remarkably so, the *Orchideæ* being spring flowers, the *Leguminosæ* summer, the *Compositæ* autumn, and the *Cryptogamia* winter.

That the peculiarities of the Australian Flora in no way disturb the principles of natural arrangement derived from the study of the Flora of the globe apart from that of Australia; for after having attempted to consider the Australian vegetation in a classificatory point of view, shutting out of my view, as far as I could, that of other countries, I have been led to the conclusion that the authors of the Natural System—Ray, Linnæus,* and the Jussieus—might have developed the same Natural System had they worked upon Australian plants instead of upon European.

I find further, that the classes, orders, genera, and species, may be about as well (or as ill) fixed or limited by a study of their Australian members as by those of any other country similarly circumstanced, and that there is the same vagueness as to the exact limits of natural groups, a similar inequality amongst them in numerical value and botanical characters, and an analogous difficulty in forming subclasses intermediate between classes and orders, as other Floras present. The Australian Flora, in short, neither breaks down nor improves the Natural System of plants as a whole, though it throws great light on its parts; the Australian genera fall into their places in that system well enough, though that system was developed before Australia was known botanically, and was chiefly founded upon a study of the vegetation of its antipodes.

Thus, whether the Australian Flora is viewed under the aspect of its morphology and structure, as exhibited by its natural classification, or its numerical proportions or geographical distribution, it presents essentially the same primary features as do those of the other great continents: and it hence appears to me rash to assume that its origin belongs to another epoch of the earth's history than that of other Floras, when the proportions of its classes, etc., are identically the same with these; or that it should be attributed to a distinct creative effort, if this is manifested only in effecting morphological differences requisite to constitute species and genera in our classification, without disturbing the proportions of these; or that the local influence of the Australian climate should be essentially different from that of other countries, and yet effect no physiological change in the periods of flowering and fruiting, or produce any other functional disturbances of the vegetable organisms, or affect the agency of humidity, temperature, soil, and elevation, on plants.

I shall now take the Australian Flora in greater detail, and dwell more at length upon those features from which I have derived the above conclusions.

* The real merits of Linnæus as a founder of the Natural System have never been appreciated. In the well deserved admiration of the genius and labours of the Jussieus, it is forgotten that the powers displayed by Linnæus in constructing the Genera Plantarum was not less (perhaps greater) than that exercised in grouping these into those genera of a higher value, which are now called Jussieuan Orders. The history of our Natural System presents but four salient points:—I. Ray's division of all plants into Phænogams and Cryptogams, and of the former into Monocotyledons and Dicotyledons. II. Linnæus's forming natural groups called Genera, and rendering a knowledge of them accessible to scientific minds by means of a binomial nomenclature and a mixed natural and artificial system of Classes and Orders. III. The Jussieus' combining most of the genera of Linnæus into truly Natural Orders, under Ray's classes, which classes they divided into subclasses as artificial as many of Linnæus's classes were. IV. The separation of Gymnosperms, by Brown, which is the first step towards a natural classification of the Jussieuan Orders of Dicotyledons. (See Lond. Journ. of Bot. and Kew Gard. Misc. ix. 314 *note*.)

§ 2.

Estimate of the Australian Flora, and some General Remarks on the Classes and Orders, their Numbers, Distribution, and Affinity.

I estimate the Flowering Plants known to be indigenous to Australia* at about 8,000 species, a number which will not in all probability be much increased by further investigations, because it includes upwards of 500 of which I have seen no specimens, and a considerable proportion of which will no doubt prove to be founded on error, and it includes a much larger number which I have reason to believe will prove to be varieties,† when more of their forms are collected, or themselves more carefully studied.

About ten years ago (1849), Brown, in the appendix to Sturt's Voyage, estimated the Australian Flora at something under 7,000 species; since which period 1,000 species have not been added, although the explored area has been greatly enlarged, both by surveys of the tropical coasts, and inland journeys made to the north of the Tropic of Capricorn, and especially by the investigations of Dr. Mueller, during his adventurous explorings of the Australian Alps, and of the northern and eastern parts. Dr. Mueller‡ himself, who has personally explored more of the continent than any other botanist, except the late Allan Cunningham, considers that the total Flora, including the undiscovered species, Phænogamic and Cryptogamic (exclusive of the minute *Fungi* and fresh-water *Algæ*), cannot exceed 10,000 species. Cryptogamic plants are known to be extremely rare in Australia as compared with Phænogamic; nevertheless, as they already amount to fully 2,000 discovered species,§ I suspect that Dr. Mueller's estimate is more probably too low than too high, and that we may assume 9,000–10,000 flowering plants as an approximation to the number that will eventually be found to be indigenous to Australia.‖

Considering that the vegetation of Australia is confined to a belt of more or less fertile land surrounding an arid desert, which occupies perhaps two-thirds of its total area, and that the tropical region is an extremely poor one in plants, this Flora must be considered as very large. And if the tropical Flora is excluded, and the temperate alone compared numerically with that of Europe for instance, the very varied nature of the Australian vegetation will appear all the more remarkable. Thus the superficies clothed with any considerable number of species in extra-tropical Australia, is probably not equal to one-fifth of the similarly clothed area of Europe, which, though so much more varied in all its physical features, contains only 9,648** species, according to Nyman's list, and this

* Except when otherwise stated, I include Tasmania and its islands under the general term Australia.

† Dr. Mueller's valuable notes upon my 'Tasmanian Flora,' which will be found in the Supplement, show how very much is to be done in the reduction of species founded on herbarium specimens, even when these are unusually copious and good.

‡ Journal of the Linnæan Society, Botany, vol. ii. p. 141.

§ In Tasmania alone there are Ferns and allies, 70; Mosses and Hepaticæ, 386; Algæ, 315; Lichens, about 100; Fungi, 275. And I cannot doubt but that this number will be doubled by future discoverers.

‖ I need hardly remark, that the very different opinions entertained by botanists as to what amount and constancy of difference between many forms of plants should constitute a species, renders all such comparisons vague; and I may add that no two or more botanists can ascertain the comparative value of their opinions except they have *exactly* the same materials to work with. It is too often forgotten that in the sciences of observation what are called negative facts and evidence are worthless as compared with positive.

** Nyman, Sylloge Floræ Europæ.

includes a large proportion of what would be considered varieties in all the Australian estimates. To be more precise, I may state, that the fertile portions of the colonies of New South Wales, Victoria, South Australia, and Western Australia, do not probably, in the aggregate, exceed in area Spain, Italy, Greece, and European Turkey, and contain perhaps half as many more flowering plants, or as many as these European countries together with Asia Minor and the Caucasus do. There is, however, little or nothing to be learnt from such numerical comparisons of species, when not examined in relation to the generic and ordinal differences which characterize them, and to which I shall hereafter allude.

The relative proportions of the two great classes of Flowering plants, Monocotyledons to Dicotyledons, are as 1 : 4·6,* which is a close approximation to what is supposed to obtain in the vegetation of the whole globe (1 : 4·9),† a remarkable coincidence, when the fact I have already alluded to is borne in mind, that seven-eighths of the species, and two-fifths of the genera of Australia have not been found elsewhere on the globe.

Regarding the temperate and tropical Australian Floras separately, I find that the tropical contains about 2,200 species, and the temperate 5,800, and that the proportions of Monocotyledons to Dicotyledons in each are,—

Tropical Flora . . . 1 : 3·5 Temperate Flora . . . 1 : 5·0

Comparing these numbers with those obtained from similarly large areas, there is again a remarkable concordance,‡ exemplifying the established fact that the proportion of Dicotyledons increases with the increasing distance from the tropics. Thus we have,—

Temperate Floras.		*Tropical Floras.*	
Europe[1]	Monocot. : Dicot. :: 1 : 5·2	Western Trop. Africa[5]	Monocot. : Dicot. :: 1 : 3·6
Russian Empire[2] . .	„ „ 1 : 5·1	Ceylon[6]	„ „ 1 : 3·1
British North America[3]	„ „ 1 : 3·8	India[7]	„ „ 1 : 3·8
South Africa[4] . . .	„ „ 1 : 4·2	Tropics[8] generally .	„ „ 1 : 3·0
Australia	„ „ 1 : 5·0	Australia	„ „ 1 : 3·5

* Brown (General Remarks, p. 6) gives the proportion of Dicotyledons to Monocotyledons as rather more than 3 : 1, from which it appears that the results of subsequent collections has been to increase the number of Dicotyledons relatively to that of Monocotyledons very largely. And this is as was to be expected, for the Monocotyledons are most widely diffused, and hence tend to preponderate unduly in incomplete Floras.

† According to Lindley's 'Vegetable Kingdom,' in which the numerical values of the Orders, as regards the genera and species they contain, were obtained with great labour, and are entitled to much confidence.

‡ Brown, on the contrary (Gen. Remark), found a considerable discordance on this very point, for his materials from New South Wales and from King George's Sound both gave the proportion of Monocotyledons to Dicotyledons as very nearly 1 : 3, and his Tropical Flora the same. He adds :—"I confess I can perceive nothing, either in the nature of the soil or climate of Terra Australis, or in the circumstances under which our collections were formed, to account for the remarkable exceptions to the general proportions of the two classes in the corresponding latitudes of other countries."

I have satisfied myself, by a comparison of the relative distribution of Monocotyledons and Dicotyledons within Australia, that this discordance was only apparent, and due to the fact of his collections not being complete enough. I have elsewhere remarked that the same source of error has vitiated Brown's estimates of the proportions of the classes in Western Africa (Linn. Trans. xx. p. 240 *note*).

[1] Nyman, Sylloge. [3] Hooker's 'Flora Boreali-Americana.' [5] Hooker's 'Niger Flora.'

[2] Ledebour, 'Flora Rossica.' [4] Drége, Meyer, Harvey's MSS., etc. [6] Thwaites's 'Summary.'

[7] Author's MSS. The Indian Flora here estimated includes a large number of temperate and alpine plants, and the proportion of Dicotyledons is hence high. [8] A. De Candolle, Geogr. Bot. p. 1188.

The Gymnospermous Dicotyledons being regarded by many botanists as a class equivalent in rank with all Angiospermous Phænogams, and all the Australian species being endemic, I have thought it might be interesting approximately to compare their proportions to other Phænogams. They are,—

In Australia	1 : 184
In Europe	1 : 194
In the Russian Empire	1 : 160
In India	1 : 292
In the whole world	1 : 315

I may remark, that in selecting Floras for comparing the proportions of Orders, it is necessary to take such as embrace a very large area, and are moreover tolerably well defined as botanical provinces. Of those I have compared, India is inapplicable, being a heterogeneous assemblage of temperate, tropical, and alpine plants, the tropical being however so far dominant as to determine the main results. Ceylon, again, is both far too small as an area, and is not a botanical province; the proportions of the Indian Orders in it are, however, on the whole, so well balanced, that it gives normal results.

The number of Natural Orders of Phænogamic plants in Australia is about 152.* Of these none are absolutely peculiar except *Brunoniaceæ* and *Tremandreæ*, which may without violence be respectively appended to *Goodeniaceæ* and *Buettneriaceæ*. Of about fifty absent Orders, the following are universally recognized as large and tropical Indian, and their total absence in Australia is certainly anomalous; *Ternstrœmiaceæ* (if *Cochlospermum* be excluded), *Dipterocarpeæ*, *Guttiferæ* (exclusive of *Calophyllum*), *Ochnaceæ*, *Connaraceæ*, *Balsamineæ*, *Begoniaceæ*, *Vaccinieæ*.

The following are also tropical Indian, but are small; some of them are not universally recognized, but are appended by various authors to other Orders which do exist in Australia:—

Samydeæ: a family of *Bixaceæ*.
Tamariscineæ.
Myriceæ: of which *Casuarineæ* are possibly a family.
Pyrenacantheæ: referred to *Antidesmeæ* or *Euphorbieæ*.

The following are temperate Orders, found elsewhere in the southern hemisphere, but not in Australia:—

Fumariaceæ: a Suborder of *Papaveraceæ*.
Salicineæ: almost entirely a northern Order.
Berberideæ: ditto, except in the South American Andes.
Valerianeæ: ditto, except in the South American Andes.

The Orders which, without being absolutely confined to Australia, are either peculiarly characteristic of that country, or are almost entirely confined to it, are either very small indeed, or are sections of larger Orders, as,—

* The following estimates are founded on the assumption that there are about 200 Natural Orders in all the Vegetable Kingdom, that is to say, so many Natural groups which are—1. Types of structure common in most cases to a large number of species, and containing several or many Genera; 2. Groups absolutely definable by natural characters, or betraying a transition to other groups by only a small proportion of their species. My views on these points accord with those of Bentham (Linn. Soc. Journ. Bot. vii. p. 31) and Asa Gray, who also consider 200 as a fair approximate estimate of the known Natural Orders.

Stackhousiæ: containing only about 20 species, and of which representatives are found in New Zealand and the Philippine Islands.
Goodeniaceæ: very closely allied to *Campanulaceæ* and *Lobeliaceæ*.
Stylidieæ: ditto.
Epacrideæ: a division of *Ericeæ*.
Casuarineæ: very near *Myriceæ*.
Xerotideæ, Aphyllantheæ } sections of *Liliaceæ* or *Junceæ*.

Other Orders which are less peculiar but are largely developed and equally or more characteristic of Australian vegetation than the other, are:

Dilleniaceæ, after Australia, abound most in			India.
Rutaceæ	„	„	South Africa.
Proteaceæ	„	„	Ditto.
Restiaceæ	„	„	Ditto.
Thymeleæ	„	„	Ditto.
Hæmodoraceæ	„	„	Ditto.
Buettneriaceæ	„	„	Ditto.
Droseraceæ	„	„	Ditto.

Turning again to other countries which are remarkable for the peculiarity of their vegetation, I find that South America contains many more peculiar families than Australia, and South Africa about as many.

§ 3.

On the Australian Distribution of Natural Orders.

I have attempted in various ways so to group the Orders as to show the geographical distribution of the characteristic ones; of these I shall select the following as illustrating most clearly, both that the temperate Flora is more peculiar than the tropical, and that that quarter of the continent which is geographically most isolated contains the greatest number of peculiar features.

A. Orders which are most characteristic of Australia, and almost confined to it:—

1. Stackhousieæ	*has most species in the*	South-west;	*next,*	South-east;	*fewest in the*	Tropics.
2. Goodeniaceæ	„	South-west	„	South-east	„	Tropics.
3. Stylidieæ	„	South-west	„	South-east	„	Tropics.
4. Epacrideæ	„	South-east	„	South-west	„	Tropics.
5. Tremandreæ	„	South-west	„	South-east	„	Tropics.
6. Casuarineæ	„	South-west	„	South-east	„	Tropics.
7. Xerotideæ	„	South-west	„	South-east	„	Tropics.

Hence, Six-sevenths attain their maximum in the South-west.
One-seventh „ „ South-east.
None „ „ Tropics.

B. Orders which attain their maximum in Australia, and most of the Australian genera and species of which are peculiar to that country:—

1. Proteaceæ	*has most species in the*	South-west;	*next,*	South-east;	*fewest in the*	Tropics.
2. Dilleniaceæ	„	South-west	„	South-east	„	Tropics.
3. Droseraceæ	„	South-west	„	South-east	„	Tropics.
4. Myoporineæ	„	South-west	„	South-east	„	Tropics.
5. Rutaceæ	„	South-east	„	South-west	„	Tropics.
6. Haloragеæ	„	South-east	„	South-west	„	Tropics.
7. Pittosporeæ	„	South-west	„	South-east	„	Tropics.
8. Thymeleæ	„	South-east	„	South-west	„	Tropics.
9. Hæmodoraceæ	„	South-west	„	South-east	„	Tropics.
10. Restiaceæ	„	South-west	„	South-east	„	Tropics.

Here again, Seven-tenths attain their maximum in the South-west.

Three-tenths	„	„	South-east.
None	„	„	Tropics.

C. Orders which are not at all peculiar to Australia, and do not there attain their maximum, but of which more than half the species are peculiar, and many belong to peculiar Australian genera:—

1. Leguminosæ	*has most species in the*	South-east;	*next,*	South-west;	*fewest in the*	Tropics.
2. Myrtaceæ	„	South-west	„	South-east	„	Tropics.
3. Compositæ	„	South-east	„	South-west	„	Tropics.
4. Umbelliferæ	„	South-east	„	South-west	„	Tropics.
5. Irideæ	„	South-west	„	South-east	„	Tropics.
6. Melanthaceæ	„	South-east	„	South-west	„	Tropics.
7. Santalaceæ	„	South-west	„	South-east	„	Tropics.
8. Phytolaccеæ	„	South-west	„	South-east	„	Tropics.
9. Saxifrageæ	„	South-east	„	South-west	„	Tropics.

This gives Five-ninths attaining their maximum in the South-east.

Four-ninths	„	„	South-west.
None	„	„	Tropics.

D. Orders, all containing upwards of thirty species, but of which comparatively few, or none, of the genera are peculiar.

1. Gramineæ	*has most species in the*	Tropics;	*next,*	South-east;	*fewest in the*	South-west.
2. Cyperaceæ	„	South-west	„	South-east	„	Tropics.
3. Orchideæ	„	South-east	„	South-west	„	Tropics.
4. Euphorbiaceæ	„	Tropics	„	South-east	„	South-west.
5. Labiatæ	„	South-east	„	South-west	„	Tropics.
6. Liliaceæ	„	South-east	„	South-west	„	Tropics.
7. Rubiaceæ	„	Tropics	„	South-east	„	South-west.
8. Scrophularineæ	„	Tropics	„	South-east	„	South-west.
9. Amaranthaceæ	„	South-west	„	Tropics	„	South-east.
10. Chenopodiaceæ	„	South-west	„	South-east	„	Tropics.
11. Sapindaceæ	„	Tropics	„	South-west	„	South-east.
12. Malvaceæ	„	Tropics	„	South-east	„	South-west.
13. Convolvulaceæ	„	Tropics	„	South-east	„	South-west.
14. Rhamneæ	„	Tropics	„	South-west	„	South-east.

15. Verbenaceæ	*has most species in the*	Tropics;	*next,*	South-west;	*fewest in the*	South-east.
16. Loganiaceæ	„	Tropics	„	South-west	„	South-east.
17. Cruciferæ	„	South-east	„	South-west	„	Tropics.
18. Loranthaceæ	„	Tropics	„	South-east	„	South-west.
19. Lobeliaceæ	„	South-west	„	South-east	„	Tropics.
20. Urticeæ	„	Tropics	„	South-east	„	South-west.
21. Ranunculaceæ	„	South-east	„	South-west	„	Tropics.
22. Polygaleæ	„	South-west	„	South-east	„	Tropics.
23. Solaneæ	„	Tropics	„	South-east	„	South-west.
24. Lentibularineæ	„	South-east	„	South-west	„	Tropics.
25. Borragineæ	„	Tropics	„	South-west	„	South-east.

The sequence in this case is wholly inverted from what obtained in A and B, and we have—

Fourteen twenty-fifths	attaining	their maximum	in the Tropics.
Six twenty-fifths	„	„	South-east.
Five twenty-fifths	„	„	South-west.

This accumulation of ordinal and generic peculiarity of Australian vegetation in the south-west quarter of the continent, as compared with the south-east especially, is a very remarkable feature; it would still have been very striking had there been any contrasting peculiarity of climate or surface between these districts, which is not the case.

An examination of the proportions which the largest Natural Orders bear to the whole Flora affords very important data for determining the relations of a Flora. I find that half the Australian species are included under the following Orders, which I have here arranged nearly in the order of their numerical extent, and contrasted them with those of some other countries.

Australia.	*India.*	*South Africa.*	*Europe.*	*World.*
1. Leguminosæ.	Leguminosæ.	Compositæ.	Compositæ.	Compositæ.
2. Myrtaceæ.	Rubiaceæ.	Leguminosæ.	Leguminosæ.	Leguminosæ.
3. Proteaceæ.	Orchideæ	Ericeæ.	Cruciferæ.	Gramineæ.
4. Compositæ.	Compositæ.	Gramineæ.	Gramineæ.	Orchideæ.
5. Gramineæ.	Gramineæ.	Liliaceæ.	Umbelliferæ.	Rubiaceæ.
6. Cyperaceæ.	Euphorbiaceæ.	Irideæ.	Caryophylleæ.	Euphorbiaceæ.
7. Epacrideæ.	Acanthaceæ.	Diosmeæ.	Scrophularineæ.	Labiatæ.
8. Goodeniaceæ.	Cyperaceæ.	Scrophularineæ.	Labiatæ.	Myrtaceæ.
9. Orchideæ.	Labiatæ.	Geraniaceæ.	Ranunculaceæ.	Cyperaceæ.

Hence it appears, that of the nine Natural Orders which together include upwards of half the known Australian Flowering Plants, three Orders are similarly characteristic of all the other areas compared, two of three areas, and two of two areas. In other words,—

Compositæ, Leguminosæ, and Gramineæ, are found in all five areas.
Cyperaceæ and Orchideæ, in three.
Epacrideæ (Ericeæ) and Myrtaceæ, in two.
Goodeniaceæ and Proteaceæ, in Australia alone.

Rude as the above data and methods of comparison are, they appear clearly to corroborate the

opinion, that the fundamental features of the Australian vegetation are not very different from those of the rest of the world, or than the vegetations of other large areas in the world are from one another.

§ 4.

On the Genera of the Australian Flora.

The number of Genera of Australian Flowering Plants exceeds 1,300, and each genus has on the average about six species: the Monocotyledons differ in this respect from the Dicotyledons in having rather fewer species to each genus. This proportion is of course smaller than obtains for the whole globe (10·5, Lindley), for Europe (about 8), and India (about 5).

Of these genera a large number (between 500 and 600) are peculiar to Australia, but a rather larger number are common to India and its islands; 212 are European, and 146 British.

The proportion of endemic Australian genera is much larger amongst Dicotyledons, and is very conspicuously great in those Orders which themselves numerically preponderate, as *Myrtaceæ, Goodeniaceæ, Epacrideæ, Proteaceæ, Myoporineæ*, thus indicating that the generic peculiarities of the vegetation are in a certain sense restricted.

I have endeavoured to arrange approximately the principal Natural Orders with respect to the number of endemic genera they contain, and their prevalence, as follows:—

1. Orders or Natural groups characteristic of the Flora, and half whose genera are endemic.

a. All genera endemic:—

Hæmodoraceæ, Xerotideæ, Tremandreæ.

b. Upwards of three-fourths of the genera endemic:—

Melanthaceæ.	Buettneriaceæ.	Myoporineæ.	Myrtaceæ.
Irideæ.	Rutaceæ.	Proteaceæ.	Cruciferæ.
Dilleniaceæ.	Stylidieæ.	Epacrideæ.	Cycadeæ.
Pittosporeæ.	Santalaceæ.	Goodeniaceæ.	

c. Between half and three-quarters of the genera endemic:—

Restiaceæ.	Umbelliferæ.	Phytolacceæ.	Saxifrageæ.
Leguminosæ.	Compositæ.	Stackhousiæ.	

2. Orders or large groups characteristic of the Flora in various respects, which are numerically great, and less than half whose genera are endemic.

a. Few or no endemic genera:—

Ranunculaceæ.	Borragineæ.	Polygoneæ.	Juncagineæ.
Loganiaceæ.	Plantagineæ.	Laurineæ.	Xylideæ.

b. Upwards of three-fourths not endemic:—

Malvaceæ.	Droseraceæ.	Solaneæ.	Thymelææ.
Rhamneæ.	Polygaleæ.	Asclepiadeæ.	Urticeæ.
Haloragеæ.	Rubiaceæ.	Scrophularineæ.	Naiadeæ.
Portulaceæ.	Convolvulaceæ.	Lentibularineæ.	Commelyneæ.
Loranthaceæ.			

c. Between three-fourths and one-half not endemic :—

Cruciferæ.	Verbenaceæ.	Euphorbiaceæ.	Liliaceæ.
Sapindaceæ.	Labiatæ.	Orchideæ.	Cyperaceæ.
Lobeliaceæ.	Chenopodieæ.	Smilaceæ.	Gramineæ.
Apocyneæ.	Amaranthaceæ.		

The above estimates are very rude, and intended to show tendencies in the general vegetation. It appears from them, that out of the twenty-five Orders, half of whose genera are endemic, but few are really much restricted in distribution; and that there are thirty-nine Orders universally distributed over the globe which play a conspicuous part in the vegetation of Australia, but of whose genera less than half are peculiar to that country. On the other hand, the twenty-three first-named Orders comprise considerably more than half the species of Australian Flowering Plants.

In point of number of species they contain, the Australian genera may be arranged approximately, as follows.

Above 200 species,—

Acacia.

Above 100 species,—

Eucalyptus.	Leucopogon.	Grevillea.
Melaleuca.	Stylidium.	Hakea.

Above 50 species,—

Pimelea.	Daviesia.	Dryandra.	Drosera.
Goodenia.	Eurybia.	Lepidosperma.	Dampiera.
Persoonia.	Boronia.	Xerotes.	Helichrysum.
Pultenæa.	Banksia.	Dodonæa.	Trichinium.

These genera together comprise upwards of 2,000 species, are almost without exception very characteristic of extratropical Australian vegetation, and nearly all are highly characteristic of Australia and its islands.

One-half of the genera of Australian Flowering Plants are included in the following Orders :—

1. Compositæ.	5. Cyperaceæ.	9. Proteaceæ.	12. Goodeniaceæ.
2. Leguminosæ.	6. Euphorbiaceæ.	10. Scrophularineæ.	13. Liliaceæ.
3. Gramineæ.	7. Orchideæ.	11. Rubiaceæ.	14. Labiatæ.
4. Myrtaceæ.	8. Epacrideæ.		

Of the peculiar genera of Australia, on the other hand, one-half of the whole are comprised in the following Orders :—

1. Compositæ.	4. Epacrideæ.	6. Goodeniaceæ.	8. Orchideæ.
2. Leguminosæ.	5. Proteaceæ.	7. Liliaceæ.	9. Euphorbiaceæ.
3. Myrtaceæ.			

Had I the materials, it would have been interesting to have extended this inquiry to the character of the genera themselves, and especially as to whether the arboreous or herbaceous prevailed, one of the most striking characters of the Australian vegetation being the great number of peculiar genera, amongst which a large proportion are trees or large shrubs.

§ 5.

On the Tropical Australian Flora.

There are no geographical or other features of the Australian continent which enable me to draw any natural boundary between temperate and tropical Australia. In selecting a botanical tropic of Capricorn, I hence have had recourse to the distribution of the plants themselves, and these must afford very vague data. The tropical Flora, in one form, advances further south on the west coast and on the central meridian than on the east, because of the absence of mountains, and hence of water, on the west, which causes combine to favour the prevalence of hot, desert types of vegetation, many of which advance even to Swan River. On the east coast again the climate is moister, and we hence not only find the most marked features of extratropical Australian vegetation,—*Stackhousia, Boronia, Tetratheca, Comesperma,* various genera of *Epacrideæ, Leguminosæ, Myrtaceæ,* etc., advancing in full force as far north as Moreton Bay, lat. 27°, which I have somewhat arbitrarily assumed there to be the limit of the temperate Flora,—but Palms and other tropical forms running down the coast almost to Bass's Straits. To the northward of Moreton Bay (judging especially from Mr. Bidwill's Wide Bay collections) not only do many temperate forms disappear, but tropical ones,—*Malvaceæ, Sterculiaceæ, Acanthaceæ, Euphorbiaceæ, Convolvulaceæ, Meliaceæ,* and *Sapindaceæ, Ficus,* together with numerous tropical Indian weeds,—become a prevailing feature in the landscape. The Araucarias, according to M'Gillivray (Voy. Rattlesnake, 1846–50), begin at Port Bowen and advance to Cape Melville. *Pandanus,* according to the same authority, commences at Moreton Island.

On the west coast I am puzzled where to draw the line. Judging from Drummond's herbarium, formed between the Moore and Murchison rivers (lat. 27° 30′ S.), the vegetation is there still typically that of the Swan River, though much modified, and reduced greatly in number of genera and species. Sir G. Grey, in his adventurous journey from Port Regent to Swan River, enumerates various eminently tropical forms as occurring to the north of Sharks Bay (lat. 26° S.), as Nutmeg,* *Araucaria,** *Calamus* (abundant), Vines, many Figs, and *Areca,* together with a *Banksia* of Swan River, which he distinctly alludes to as being quite exceptional (p. 247). To the southward of Sharks Bay again, he met with *Xanthorrhœa* and Sow-thistle,† both of whose northern limits he gives as 28° S., and *Zamia* (lat. 29° S.). The parallel of Sharks Bay, I have hence assumed to be north of the position of the tropic of vegetation.

In determining what may be called the tropic of vegetation, regard must be had not only to the latitude and isothermal lines, but to the abundance of the vegetation and its character: and, indeed, in such a country as Australia the latter elements are perhaps of the greatest importance, owing to the diminution northward of so many peculiar genera that make up a large proportion of the extra-tropical vegetation, and to the fact that the tropical Flora is so very poor in number of species, and deficient in such conspicuously tropical genera as Epiphytic Orchids, Palms, Ferns, *Scitaminea,* etc. etc.

Taking all elements into consideration, of the vegetation, actual temperature, and relative hu-

* I find no notice elsewhere of these genera being found on the west coast, and suspect some error.

† Leichardt mentions the Sow-thistle as abundant in lat. 25° 30′ S. on the Gilbert range.

midity, we may assume that the tropical and temperate Australian Floras blend on both (east and west) meridians at between lat. 26° and 29° S.; and had we complete Floras of the included parallels of latitude, it would not be difficult to determine by the affinities of the peculiar (endemic) species, and the distribution of those that extend either north or south of those parallels, which to refer to the tropical Flora and which to the temperate.

With regard to the actual temperature of the Australian tropical vegetation, it approximates to the isothermal of 68°.

The general botanical features of the tropical vegetation may be gathered from the excellent narratives of Leichardt, Mitchell, M'Gillivray, Carron, and especially of Mueller, for the interior, and of Brown, Cunningham, and M'Gillivray for the coasts. The most prominent feature is the rarity of Cryptogams, which are almost wholly absent in western and central tropical Australia, and in the islands of the Gulf of Carpentaria, but are more abundant (especially the Ferns) on the north-east coast. The absence of Bamboos is another very striking feature, though these are said to abound in Arnheim's Land (Mueller, Linn. Journ. Bot. ii. p. 138). Epiphytic Orchids are also very rare. *Eucalypti* and *Acaciæ* form the mass of the arboreous and shrubby vegetation here as elsewhere throughout Australia, next to which some of the most common and noticeable arboreous features of vegetation are afforded by clumps of *Pandani* (one species indicating fresh-water in the interior), *Brachychiton*, *Adansonia*, on the north-west quarter, and *Cochlospermum*, and many other genera on the north-east. *Casuarina*, *Callitris*, and other large trees seem to be rare though not wholly wanting on the west coast.

The principal tropical phases of vegetation described by Mueller are,—

1. The varied arboreous and shrubby clothing of the eastern slopes of the eastern ranges, where numerous Indian genera of umbrageous trees are interspersed with Australian; this, called the "Brushwood," or "Cedar" country, further contains the most numerous representatives of the Polynesian and Malayan Floras; together with *Cycas* thirty feet high, and various Palms of the genera *Calamus*, *Areca*, *Caryota*, and *Livistona*.

2. The "Brigalow Scrub" extends over the elevated sandstone plains west of the coast range in east Australia, as far as the Newcastle range (lat. 18°–20°). This is also a very varied vegetation, chiefly of small trees and shrubs of *Capparideæ*, *Pittosporeæ*, *Bauhinia*, *Sterculiaceæ*, etc. Here *Delabechia* and *Brachychiton*, form a remarkable secondary feature; distinguished as the Bottle-tree Scrub, from their tumid trunks. This vegetation is elsewhere * described by Mueller as extending from the Burdekin to the Upper Darling rivers, and ceasing towards the south-west, somewhere near Mount Serle, Mount Murchison, or Cooper's river.

3. Open downs of basalt, nearly destitute of trees, except along watercourses. The vegetation is chiefly herbaceous, and much of it annual; the soil is rich, and after the rains produces a luxuriant crop of excellent grass and herbaceous plants.†

4. The desert presents various assemblages of plants according as the soil is saline, clayey, or sandy, but these plants are almost the same as those of extratropical Australia, with the exception of various species of *Portulaceæ*, *Solanum*, *Euphorbia*, *Cassia*, *Gomphrena*, *Ptilotus*, *Trianthema*, *Aylmeria*, and other *Paronychieæ*.

* Report on Plants of Babbage's Expedition, (Victoria, 1858).

† Mueller remarks that a *Verbena* forms so conspicuous a feature over large tracts of country as to have suggested the name of Vervain Plains; it is very singular that this should be the South American *V. Bonariensis*, and I should think an introduced plant.

5. The sandstone table-land presents an arid, cheerless landscape, described by Dr. Mueller in terms that apply perfectly well to the sandstone table-lands of the peninsula of India, and indeed many of the characteristic genera are common to both. These consist of *Terminalia, Melia, Cochlospermum, Sterculia, Buchanania, Zizyphus, Nauclea, Bauhinia, Indigofera, Erythrina, Gardenia, Strychnos, Santalum,* a profusion of Andropogoneous Grasses, and other shrubs and herbs, all of which the Indian botanist recognizes at once as the prominent features of the sandstone ranges of western Bengal, and central India.

6. The sea-coasts are chiefly tenanted by an Indian vegetation, consisting of *Avicennia, Rhizophoreæ, Pandaneæ, Spinifex, Zoysia, Suriana, Ægiceras, Pemphis, Tribulus,* together with *Colubrina, Ipomœa,* etc.

To these Dr. Mueller adds, as a seventh region, the banks of the northern rivers, which, however, seem scarcely to afford a peculiar vegetation.

Other plants worthy of notice, as natives of tropical Australia, are a species of *Musa* and *Nepenthes,* both mentioned by M'Gillivray, who also is the authority for the occurrence of a clump of Cocoa-nuts* on Frankland Island, for the Pomegranate on Fitzroy Island, and *Caryota urens,* at Cape York. The same naturalist discovered *Balanophora fungosa* of New Caledonia at Rockingham Bay, and no doubt there are many other plants of the Malayan and Polynesian islands still to be detected in similar localities.

The number of species in tropical Australia appears to be extremely small, owing, no doubt, much to the dryness of the climate, and to the absence of any large rivers, swamps, and mountains; as also to the short duration of the rainy season, which in many parts of the coast lasts only from November to January. Many discoveries may yet be anticipated, when it is considered how many very common tropical Indian and Malay Archipelago weeds may be found to occur here and there along the coast: but Brown spent many months on the tropical shores, and Cunningham several years; Mueller traversed northern Australia, Armstrong resided some years at Port Essington; and we have considerable collections from Bynoe, Mitchell, Bidwill, and M'Gillivray; and it must hence be doubtful whether future explorers will raise the known number of 2,200 tropical flowering species to much above 3,000.

Mueller's collections alone contain, of plants collected between the Victoria River and Moreton Bay, 160 Natural Orders, 600 Genera, and 1,790 Species, including Cryptogamia; but as the Moreton Bay Flora can hardly be called Tropical, and as Mueller includes 14 Orders which scarcely advance north of the tropic of Capricorn, I must exclude, perhaps, 500 species, including Cryptogamia, to work his results into my estimate, which includes 148 Natural Orders, 700 genera, and 2,200 species.

The most extensive tropical Natural Orders are,—

Australia.	*Tropical Africa.*	*India.*	*West Indies.*†
Leguminosæ.	Leguminosæ.	Leguminosæ.	Leguminosæ.
Gramineæ.	Rubiaceæ.	Rubiaceæ.	Compositæ.
Myrtaceæ.	Gramineæ.	Orchideæ.	Rubiaceæ.
Compositæ.	Compositæ.	Compositæ.	Gramineæ.

* Captain King (Voy. i. p. 194) mentions having picked up cocoa-nuts on the beach at Cape Cleveland; Flinder's (ii. p. 49) at Shoal-water Bay; and Cook's party found old husks at the mouth of the Endeavour River. To all these places the fruit or its remains was no doubt brought by currents.

† Chiefly founded on Grisebach's Essay on the Plants of Guadeloupe, etc.

Tropical Australia.	*Tropical Africa.*	*India (trop. and temp.)*	*West Indies.*
Cyperaceæ.	Cyperaceæ.	Gramineæ.	Cyperaceæ.
Euphorbiaceæ.	Acanthaceæ.	Euphorbiaceæ.	Euphorbiaceæ.
Malvaceæ.	Malvaceæ.	Acanthaceæ.	Scrophularineæ.
Convolvulaceæ.	Euphorbiaceæ.	Cyperaceæ.	Melastomeæ.
Goodeniaceæ.	Convolvulaceæ.	Labiatæ.	Convolvulaceæ.
Proteaceæ.	Urticeæ.		Myrtaceæ.

Mueller has given, in his 'General Report on the Botany of the North Australian Expedition,' some valuable tables, showing approximately the order of succession in which temperate forms appear in advancing southward in Australia, and these give us a wide idea of the immensely extended distribution of many endemic species. He enumerates no less than 225 Victoria colony species as occurring to the north of lat. 26° S., and of these I find nearly 90 to be Tasmanian. Many of them are properly tropical forms that attain the latitude of Victoria only in the hot deserts, but many are essentially temperate forms. The whole are thus distributed :—

Lat. 17° 30′ S.	to	20° S.	Victoria species,	32 ;	Tasmania,	10.
20°	„	23°	„	24	„	6.
23°	„	26°	„	51	„	21.
26°	„	27°	„	118	„	52.

The diminution of vegetable forms in advancing from temperate to tropical Australia is to a great extent due to the rarity or absence of Orders which, though more typical of hot latitudes in other parts of the globe, abound in the temperate regions only of Australia. I have marked these with an asterisk in the following list of extratropical Australian Orders that diminish rapidly or are absent in the tropics of that continent :—

Ranunculaceæ.	Rutaceæ.	Compositæ.	Casuarineæ.
*Dilleniaceæ.	Stackhousieæ.	Lobeliaceæ.	Coniferæ.
Cruciferæ.	*Rhamneæ.	Epacrideæ.	*Orchideæ.
Tremandreæ.	Rosaceæ.	Myoporineæ.	Irideæ.
*Buettneriaceæ.	*Myrtaceæ.	Labiatæ.	Hæmodoraceæ.
Geraniaceæ.	Crassulaceæ.	Plantagineæ.	*Liliaceæ.
Violariæ.	Cunoniaceæ.	Proteaceæ.	Junceæ.
Droseraceæ.	Haloragеæ.	*Santalaceæ.	Xerotideæ.
*Polygaleæ.	Umbelliferæ.	Daphneæ.	*Restiaceæ.

Those Orders, again, which are confined to the Tropics, are unexceptionally common Indian ones, and which it is not necessary to specify. There are, however, several of the most typically Indian Orders that are very scarce or absent in tropical Australia, amongst which the most remarkable are :—

Anonaceæ.	Rhamneæ.	Symplocеæ.	Laurineæ.
Menispermeæ.	Melastomaceæ.	Myrsineæ.	Cupuliferæ.
Guttiferæ.	Araliaceæ.	Acanthaceæ.	Dioscoreæ.
Celastrineæ.	Vaccinieæ.	Cyrtandreæ.	Aroideæ.

The peculiar features of the extratropical Australian Flora are mainly kept up in its tropical quarter, by the following plants :—

Dilleniaceæ (a few genera of).
Drosera.
Pittosporeæ.
Eucalyptus, and a few other genera of Myrtaceæ.
Acacia, and a few other genera of Leguminosæ.
Stylidium.
Myoporineæ.
Grevillea, and a few other Proteacea.
Casuarina.
Callitris.
Loganiaceæ.
Restiaceæ.
Xerotideæ.

Of the tropical Australian plants nearly 500, included under 273 genera, are either identical with continental or insular Indian species, or are so very closely allied to them as to require a further examination to distinguish them.* To make this list more useful, I have given the extra-Australian and extra-Indian distribution of the species:—

Menispermeæ.

Stephania hernandifolia (Africa).

Nymphæaceæ.

Nelumbium speciosum, *Willd.* (Afr., Eu., Am.?).
Brasenia peltata, *Pursh* (North America).

Cruciferæ.

Nasturtium terrestre, *Br.* (Eur., Afric., Amer.).
Senebiera † integrifolia, *DC.?*

Capparideæ.

Polanisia viscosa, *DC.* (Africa, America).
Capparis sepiaria, *L.*

Droseraceæ.

Drosera Burmanni, *Vahl* (Africa).
Drosera Finlaysoniana, *Wall.*

Violaceæ.

Ionidium suffruticosum, *Ging.* (Africa).

Polygaleæ.

Polygala arvensis, *L.* (Africa).
Polygala crotalarioides, *Ham.*
Polygala Japonica, *Th.*
Polygala leptalea, *DC.* (Africa).
Polygala rosmarinifolia, *W. & A.* (Africa).

Malvaceæ.

Thespesia populnea, *Cav.* (Africa).
Paritium tiliaceum, *St. Hil.* (Africa, America).
Hibiscus radiatus, *L.*
Hibiscus panduriformis, *Burm.* (Africa).
Hibiscus heterophyllus, *Vent.*
Hibiscus Trionum, *L.* (Africa).
Abutilon Indicum, *L.* (Africa, America).
Abutilon graveolens (Africa, America).
Abutilon Asiaticum (Africa, America).
Sida cordifolia, *L.* (Africa, America).
Sida acuta, *Burm.* (Africa, America).
Sida rhombifolia, *L.* (Africa, America).

Buettneriaceæ.

Melhania incana, *Heyne.*
Heritiera littoralis, *Ait.*
Helicteres Isora, *L.*
Commersonia echinata, *Forst.*
Waltheria Indica, *L.* (Africa, America).
Melochia corchorifolia, *L.* (Africa).

Tiliaceæ.‡

Corchorus olitorius, *L.* (Africa).
Corchorus fascicularis, *Lam.* (Africa).
Corchorus acutangulus, *Lam.* (Africa).
Corchorus tridens, *L.* (Africa).

* I must caution my readers that this catalogue, being a first attempt, does not pretend to anything like absolute accuracy: it enumerates Australian species which a closer examination may probably prove to be different from Indian, and omits other plants that will be found eventually to be common to these countries. I have had no materials of any consequence to help me, but such as the herbarium affords; and I have had, for almost every species enumerated, to examine a very extensive suite of specimens often from various parts of the world. To render such a list worthy of as much confidence as is attainable in the present state of specific botany, would be a work of years.

† Found on Cato Reef, where Flinders's ships were wrecked; also in China, and believed to be the *S. integrifolia* of Madagascar.

‡ The absence of *Urena* and *Triumfetta* is remarkable.

Grewia orientalis, *L.?*
Grewia sepiaria, *Roxb.*
Grewia tiliæfolia, *Vahl?*
Grewia hirsuta, *Vahl.*
Grewia multiflora, *Juss.*

Aurantiaceæ.

Glycosmis pentaphylla, *Correa?*
Murraya exotica, *L.*

Hippocrateaceæ.

Hippocratea Indica, *Willd.*

Olacaceæ.

Opilia amentacea, *Roxb.*
Cansjera scandens, *Roxb.*
Ximenia Americana, *L.* (Africa, America).

Hypericaceæ.

Hypericum Japonicum, *Th.*

Guttiferæ.

Calophyllum inophyllum, *L.* (Africa).

Malpighiaceæ.

Tristellateia Australasica, *A. Rich.*

Sapindaceæ.

Dodonæa Burmanni, *DC.* (Africa).
Cardiospermum Halicacabum, *L.* (Africa, America).
Erioglossum edule, *Bl.*

Ampelideæ.

Leea sambucina, *L.*
Cissus lanceolaria, *Roxb.?*
Cissus adnatus, *Wall.?*

Meliaceæ.

Melia composita, *Willd.*
Xylocarpum granatum, *Kœn.*
Sandoricum Indicum, *L.*
Sandoricum nervosum, *Bl.*

Pittosporeæ.

Pittosporum ferruginèum, *Ait.?*

Oxalideæ.

Oxalis corniculata, *L.* (Africa, America).

Zygophyllaceæ.

Tribulus cistoides, *L.* (Africa, America).

Simarubaceæ.

Brucea Sumatrana, *Roxb.*

Terebinthaceæ.

Garuga floribunda, *Dcne.*
Buchanania angustifolia, *Wall.*

*Rhamneæ.**

Colubrina Asiatica, *Brong.* (Africa).

Leguminosæ.

Crotalaria verrucosa, *L.* (Africa, America).
Crotalaria calycina, *Schrenck.*
Crotalaria juncea, *L.* (Africa).
Crotalaria linifolia, *L. fil.*
Crotalaria medicaginea, *Lam.*
Crotalaria medicaginea, *var.* neglecta.
Crotalaria laburnifolia, *L.*
Crotalaria incana, *L.* (Africa, America).
Crotalaria trifoliastra *Willd.* (Africa, America).
Crotalaria retusa, *L.* (Africa).
Rothia trifoliata, *Pers.*
Indigofera linifolia, *Retz* (Africa).
Indigofera cordifolia, *Heyne* (Africa).
Indigofera enneaphylla, *L.*
Indigofera trifoliata, *L.*
Indigofera viscosa, *Lam.* (Africa).
Indigofera hirsuta, *L.* (Africa).
Tephrosia purpurea, *Pers.* (Africa).
Sesbania Ægyptiaca, *Pers.* (Africa).
Sesbania aculeata, *Pers.* (Africa).
Æschynomene Indica, *L.* (Africa).
Zornia diphylla, *Pers.* (Africa, America).
Alysicarpus scariosus, *Grah.*
Alysicarpus scariosus, *var.* thyrsiflorus.
Dendrolobium umbellatum, *Bth.* (Africa).
Uraria Lagopus, *DC.*
Dicerma biarticulatum, *DC.*
Desmodium polycarpum, *DC.* (Africa, America).
Desmodium concinnum, *DC.*
Lespedeza cuneata, *G. Don.*
Galactia tenuiflora, *W. & A.*
Canavalia obtusifolia, *DC.* (Africa, America).
Phaseolus radiatus, *L.*

* The rarity of *Zizyphus* in Australia is remarkable.

Phaseolus Truxillensis, *H. B. K.*
Vigna anomala, *Vahl* (Africa).
Rhynchosia minima, *DC.* (Africa).
Flemingia lineata, *Roxb.*
Flemingia semi-alata, *Roxb.*
Eriosema virgatum, *Bth.*
Pycnospora hedysaroides, *Br.*
Derris uliginosa, *Bth.* (Africa).
Brachypterum scandens, *Bth.*
Pongamia glabra, *Ait.* (Africa).
Sophora tomentosa, *L.* (Africa, America).
Guilandina Bonducella, *L.* (Africa, America).
Cæsalpinia sepiaria, *Roxb.*
Cæsalpinia paniculata, *Roxb.*
Cassia occidentalis, *L.* (Africa, America).
Cassia mimosoides, *L.* (Africa, America).
Cassia Absus, *L.* (Africa).
Cynometra ramiflora, *L.?*
Adenanthera pavonina, *L.?*
Acacia Farnesiana, *Willd.* (Africa, America).
Albizzia Lebbek, *Bth.* (Africa).

Rosaceæ.

Rubus rosæfolius, *Sm.* (Africa).
Rubus acerifolius, *Wall.*

Combretaceæ.

Laguncularia coccinea, *Gaud.*
Terminalia Bellerica, *Roxb.?*

Rhizophoreæ.

Carallia integerrima, *DC.*
Ceriops Candolleana, *W. & A.*
Bruguiera Rheedii, *Bl.*
Rhizophora mucronata, *Lam.* (Africa).

Onagraceæ.

Jussieua repens, *L.* (Africa, America).
Jussieua villosa, *Lam.* (Africa, America).
Jussieua angustifolia, *Lam.* (America).
Ludwigia parviflora, *Wall.*
Rotala illecebroides, *L.*
Rotala verticillaris, *L.*
Ammannia auriculata, *Lam.* (Africa).
Ammannia multiflora, *Roxb.* (Africa).
Ammannia vesicatoria, *Roxb.* (Africa).
Pemphis acidula, *Forst.* (Africa).

Haloragеæ.

Myriophyllum Indicum, *L.?*
Ceratophyllum submersum, *L.* (Eur., Afr., Amer.).

Myrtaceæ.

Barringtonia acutangula, *Gært.*
Sonneratia acida, *L.*
Careya arborea, *Roxb.*

Melastomaceæ.

Melastoma Malabathricum, *L.*

Portulaceæ.

Portulaca oleracea, *L.* (Africa, America).
Sesuvium Portulacastrum (Africa, America).
Trianthema decandra, *L.*
Mollugo Spergula, *L.* (Africa, America).
Glinus lotoides, *L.* (Africa, America).

Paronychieæ.

Polycarpæa corymbosa, *Lam.* (Africa).
Polycarpæa spicata, *W. & A.?* (Africa).

Crassulaceæ.

Bryophyllum calycinum, *L.* (Africa).

Incert. sed.

Suriana maritima, *L.* (Africa, America).

Cucurbitaceæ.

Mukia scabrella, *Arn.* (Africa).
Lagenaria vulgaris, *Ser.* (Africa).
Bryonia laciniosa, *L.* (Africa).

Umbelliferæ.

Hydrocotyle Asiatica, *L.* (Africa, America).

Rubiaceæ.

Morinda citrifolia, *L.?*
Stylocoryne racemosa, *Cav.?*
Dentella repens, *Forst.*
Guettarda speciosa, *L.* (Africa).
Epithinia Malayana, *Jack.*
Pavetta Indica, *L.*
Ixora coccinea, *L.*
Hedyotis racemosa, *Lam.*

Compositæ.

Vernonia cinerea, *Less.* (Africa, America).

Elephantopus scaber, *L.* (Africa, America).
Eclipta erecta, *L.* (Africa, America).
Sphæranthus hirtus, *Willd.*
Sphæranthus microcephalus, *Willd.*
Blumea hieraciifolia, *DC.*
Blumea Wightiana, *DC.*
Blumea lacera, *DC.* (Africa).
Pluchea Indica, *Less.*
Monenteles redolens, *Lab.*
Monenteles spicatus, *Lab.*
Siegesbeckia orientalis, *L.* (ubique terr.).
Wedelia calendulacea, *Less.*
Wedelia urticæfolia, *DC.?*
Wollastonia biflora, *DC.*
Bidens leucantha, *Willd.* (Africa, America).
Spilanthes Acmella, *L.* (Africa, America).
Myriogyne minuta (Africa, America).
Gnaphalium luteo-album, *L.* (ubique).
Youngia Thunbergiana, *DC.* (Africa).

Goodeniaceæ.

Scævola Kœnigii, *Vahl* (Africa).

Symploceæ.

Symplocos sp.?

Sapotaceæ.

Mimusops Kauki, *L.*
Ægiceras majus, *L.*

Primulaceæ.

Centunculus tenellus, *Duby* (Brazil!).

Asclepiadeæ.

Dischidia nummularia, *Br.*

Apocyneæ.

Cerbera Odollam, *Gærtn.*

Loganiaceæ.

Mitreola oldenlandioides, *Wall.*
Mitrasacme capillaris, *Wall.?*

Convolvulaceæ.

Cuscuta Chinensis, *Lamk.*
Batatas paniculata, *Chois.* (Africa).
Pharbitis Nil, *Chois.* (Africa).
Convolvulus parviflorus, *Vahl.*
Ipomœa filicaulis, *Bl.* (Africa).
Ipomœa pendula *Forst.* (Africa).
Ipomœa Coptica, *Roth* (Africa).
Ipomœa dasysperma, *Jacq.*
Ipomœa reptans, *Poir.* (Africa).
Ipomœa Pes-capræ, *L.* (Africa, America).
Ipomœa rugosa, *Chois.* (Africa).
Ipomœa tridentata, *Roth* (Africa).
Ipomœa Turpethum, *Br.* (Africa).
Ipomœa dissecta, *Willd.*
Ipomœa sessiliflora, *Roth* (Africa).
Ipomœa chryseidis, *Br.* (Africa).
Ipomœa pentadactyla, *Chois.*
Cressa Cretica, *L.* (Africa, America).
Evolvulus linifolius, *L.* (Africa, America).
Evolvulus alsinoides, *L.* (Africa).
Hydrolea Zeylanica, *L.* (Africa, America).

Solaneæ.

Solanum verbascifolium, *L.* (Africa).
Solanum nigrum, *L.* (ubique).
Solanum Indicum, *L.* (Africa).
Solanum auriculatum, *Ait.* (Africa, America).
Solanum xanthocarpum, *Schrad.?*
Physalis parviflora, *Br.* (Africa, America).

Borragineæ.

Coredia Myxa, *L.* (Africa).
Coredia subcordata, *Lam.* (Africa).
Coredia orientalis, *Br.?*
Coredia dichotoma, *Forst.*
Ehretia serrata, *Roxb.?*
Coldenia procumbens, *L.* (Africa).
Tournefortia argentea, *L.* (Africa).
Heliotropium Coromandelianum, *Retz* (Africa).
Heliotropium Europæum, *L.* (Africa).
Trichodesma Zeylanicum, *Br.* (Africa).

Scrophularineæ.

Mimulus gracilis, *Br.* (Africa).
Limnophila gratioloides, *Br.* (Africa, America).
Herpestis Monnieria, *H.B.K.* (Africa, America).
Herpestis floribunda, *Br.* (Africa).
Vandellia crustacea, *Bth.* (Africa, America).
Scoparia dulcis, *L.* (ubique).
Microcarpæa muscosa, *Br.*
Buchnera hispida, *Harv.* (Africa).

Striga hirsuta, *Bth.* (Africa).
Centranthera hispida, *Br.*

Acanthaceæ.

Adenosma uliginosa, *Br.*
Nelsonia tomentosa, *Willd.* (Africa).
Rostellularia procumbens, *Nees.*

Verbenaceæ.

Verbena officinalis, *L.* (Africa).
Lippia nodiflora, *Rchb.* (Africa).
Premna serratifolia, *L.* (Africa).
Callicarpa longifolia, *Lam.?*
Callicarpa cana, *L.?* (Africa).
Clerodendron inerme, *Br.*
Vitex trifolia, *L.* (Africa).
Vitex Negundo, *L.* (Africa).
Avicennia tomentosa, *L.* (Africa, America).

Labiatæ.

Moschosma polystachyum, *Bth.* (Africa).
Orthosiphon stramineus, *Bth.* (Africa).
Anisomeles Heyneana, *Bth.?*
Coleus atro-purpureus, *Bth.*
Dysophylla verticillata, *Bth.* (Africa).
Salvia plebeja, *Br.*
Leucas flaccida, *Br.*

Lentibularineæ.

Utricularia graminifolia, *Vahl.*

Plumbagineæ.

Ægialitis annulata, *Br.*
Plumbago Zeylanica, *L.* (Africa, America).

Nyctagineæ.

Pisonia aculeata, *L.?* (Africa, America).
Pisonia excelsa, *Blume.*
Boerhaavia diffusa, *L.* (Africa).
Boerhaavia repanda, *Willd.* (Africa).

Polygoneæ.

Polygonum plebejum, *Br.*
Polygonum lanigerum, *Br* (Africa).
Polygonum orientale, *L.*
Polygonum barbatum, *L.* (Africa).
Polygonum flaccidum, *Roxb.* (Africa, America).
Polygonum mite, *var.* serrulatum (Africa).
Polygonum minus, *Huds.*
Polygonum lapathifolium (Africa, America).
Polygonum glabrum, *Willd.* (Africa, America).
Polygonum strigosum, *Br.*

Chenopodiaceæ.

Salicornia Arbuscula, *L.* (Africa).
Salicornia Indica, *Willd.* (Africa).
Chenopodina maritima, *Moq.* (Africa, America).
Salsola brachypteris, *Moq.*

Amaranthaceæ.

Deeringia celosioides, *Br.* (Africa).
Euoxolus viridis, *Moq.* (Africa, America).
Amaranthus spinosus, *L.* (Africa, America).
Ptilotus corymbosus, *Br.*
Achyranthes canescens, *Br.*
Achyranthes aspera, *L.* (Africa, America).
Achyranthes porphyrostachys, *Wall.* (Africa).
Centrostachys aquatica, *Wall.* (Africa).
Alternanthera nodiflora, *Br.* (Africa, America).
Alternanthera denticulata, *Br.* (Africa, America).

Laurineæ.

Gyrocarpus Asiaticus, *Willd.*
Tetranthera monopetala, *Roxb.*
Hernandia Sonora, *L.* (Africa, America).

Daphneæ.

Wickstrœmia Indica, *C. A. M.*

Santalaceæ.

Exocarpus latifolia, *Br.*

Euphorbiaceæ.

Euphorbia Chamæsyce, *Willd.* (Africa, America)
Euphorbia hypericifolia, *L.* (Africa).
Euphorbia bifida, *Hook.*
Homalanthes populifolius, *Grah.*
Rottlera tinctoria, *Roxb.*
Phyllanthus Niruri, *L.* (Africa, America).
Microstachys chamælea, *A. Juss.* (Africa).
Briedelia tomentosa, *Bl.*
Flüggea leucopyris, *Willd.*
Flüggea virosa, *Roxb.*
Melanthesa Chinensis, *Bl.*

Antidesmeæ.

Antidesma paniculatum, *Roxb.* (Africa).

Piperaceæ.

Peperomia reflexa, *Diet.* (Africa, America).
Peperomia Dindygulensis, *Miq.?*

Urticeæ.

Covellia hispida, *Miq.*
Covellia oppositifolia, *Gasp.*
Fatoua Manillensis, *Walp.*
Epicarpurus orientalis, *Bl.*

Casuarineæ.

Casuarina equisetifolia, *Forst.*

MONOCOTYLEDONES.

Orchideæ.

Spiranthes australis, *Lindl.*
Microtis rara, *Br.*
Calanthe veratrifolia, *Br.*

Hydrocharideæ.

Vallisneria spiralis, *L.* (Africa).
Hydrilla dentata, *Casp.* (Africa).
Blyxa octandra, *Dne.*
Ottelia alismoides, *Pers.*

Philydraceæ.

Philydrum lanuginosum, *Br.*

Pontederaceæ.

Monochoria vaginalis, *Presl* (Africa).

Burmanniaceæ.

Burmannia distachya, *Br.*
Burmannia juncea, *Br.?*
Tacca pinnatifida (Africa).

Dioscoreæ.

Dioscorea glabra, *Roxb.* (Africa).
Dioscorea bulbifer, *L.* (Africa).

Typhaceæ.

Typha angustifolia, *L.* (ubique).

Aroideæ.

Dracontium polyphyllum, *L.*
Caladium macrorhizum, *Br.*

Pistiaceæ.

Lemna minor, *L.* (ubique).
Lemna trisulca, *L.* (ubique).

Commelyneæ.

Commelyna communis, *L.* (Africa, America).
Commelyna agrostophylla, *F. M.*
Commelyna salicifolia, *Roxb.* (Africa).
Cyanotis axillaris, *R. & S.*

Naiadeæ.

Naias minor, *L.* (Africa, America).
Halophila ovalis, *Gaud.*

Alismaceæ.

Potamogeton natans, *L.* (ubique).

Melanthaceæ.

Iphigenia Indica, *Kth.*

Xyrideæ.

Xyris Walkeri, *Wt.* (Africa?)
Xyris pauciflora, *Willd.* (Africa?)

Junceæ.

Juncus bufonius, *L.* (Africa).
Flagellaria Indica, *L.* (Africa).

Restiaceæ.

Eriocaulon sp?

Cyperaceæ.

Cyperus Haspan, *L.* (Africa, America).
Cyperus polystachyus, *Rottb.* (Africa, America).
Cyperus mucronatus, *L.* (Africa, America).
Cyperus rotundus, *L.* (Africa, America).
Cyperus articulatus, *Vahl* (Africa, America).
Cyperus flavescens, *L.* (Africa, America).
Cyperus angulatus, *Nees* (Africa, America).
Cyperus pygmæus, *Vahl* (Africa, America).
Cyperus sanguinolentus, *Vahl* (Africa, America).
Cyperus inundatus, *Roxb.* (Africa).
Cyperus aristatus, *Rottb.* (Africa, America).
Cyperus canescens, *Vahl.*
Cyperus exaltatus, *Retz* (Africa).
Cyperus auricomus, *Sieb.* (Africa, America).
Cyperus Iria, *L.* (Africa).
Cyperus Pangorei, *Ham.* (Africa).
Cyperus corymbosus, *Nees* (Africa).
Mariscus cyperinus, *Nees* (Africa).
Kyllingia cylindrica, *Nees* (Africa).

Kyllingia monocephala, *Nees* (Africa, America).
Scirpus lacustris, *L.* (Africa, America).
Scirpus triqueter, *L.* (Africa, America).
Scirpus maritimus, *L.* (Africa, America).
Scirpus mucronatus, *L.* (Africa, America).
Fuirena glomerata, *Vahl* (Africa, America).
Fuirena umbellata, *Roth* (Africa, America).
Malacochæte pectinata, *Nees & Mey.* (Afr., Amer.).
Eleocharis capitatus, *Nees* (Africa, America).
Eleocharis atropurpureus, *Nees* (Africa, America).
Eleocharis acicularis, *L.* (Africa).
Eleocharis gracilis, *Br.*
Eleocharis compacta, *Br.*
Isolepis fluitans, *Br.* (Africa).
Isolepis prælongata, *Nees* (Africa).
Isolepis supina, *L.* (Africa, America).
Isolepis setacea, *Br.* (Africa).
Isolepis barbata, *Br.* (Africa).
Isolepis trifida, *Nees* (Africa, America).
Limnochloa plantaginea, *Nees* (Africa, America).
Trichelostylis xyroides, *Arn.*
Trichelostylis miliacea, *Nees* (Africa, America).
Trichelostylis quinquangularis, *Nees* (Africa).
Fimbristylis dichotoma, *Vahl.*
Fimbristylis æstivalis, *Vahl* (America).
Fimbristylis pallescens, *Nees* (Africa).
Fimbristylis Royeniana, *Nees* (Africa).
Fimbristylis diphylla, *Vahl* (Africa, America).
Fimbristylis ferruginea, *Vahl* (Africa, America).
Fimbristylis acuminata, *Nees.*
Fimbristylis nutans, *Vahl.*
Fimbristylis polytrichoides, *Vahl.*
Fimbristylis schœnoides, *Vahl.*
Abildgaardia monostachya, *Vahl* (Africa, America)
Rhynchospora Chinensis, *Nees* (Africa, America).
Rhynchospora aurea, *Vahl* (Africa, America).
Cladium Mariscus, *L.* (Africa, America).
Morisia Wallichii, *Nees* (Africa, America).
Scleria oryzoides, *Presl.*
Scleria lævis, *Retz.*
Scleria hebecarpa, *Nees?* (Africa).
Scleria uliginosa, *Hort.* (Africa).
Scleria margaritifera, *Br.*
Diplacrum caricinum, *Br.* (Africa).
Lepironia mucronata, *Rich.* (Africa).
Carex gracilis, *Br.* (Africa).
Carex Gaudichaudiana, *Kth.*

Gramineæ.

Leersia hexandra, *Sw.* (Africa, America).
Leersia ciliata, *Roxb.* (Africa, America).
Oryza sativa, *L.*
Paspalum scrobiculatum, *L.* (Africa, America).
Paspalum distichum, *L.* (Africa, America).
Paspalum conjugatum, *L.* (Africa, America).
Eriochloa annulata, *Kth.* (Africa, America).
Coridochloa semialata, *Nees* (Africa).
Digitaria ciliaris, *Koch.* (Africa, America).
Digitaria sanguinalis, *L.* (Africa, America).
Panicum distachyon, *L.* (Africa, America).
Panicum fluitans, *L.* (Africa, America).
Panicum angustatum, *Tr.* (Africa, America).
Panicum brizoides, *L.* (Africa).
Panicum effusum, *Br.*
Panicum repens, *L.* (Africa, America).
Panicum prostratum, *Lamk.* (Africa).
Panicum Petivieri, *Tr.* (Africa).
Panicum miliaceum, *L.* (Africa, America).
Panicum Indicum, *L.*
Isachne australis, *Br.*
Oplismenus Indicus, *R. & S.* (Africa, America).
Oplismenus compositus, *R. & S.* (Africa, America).
Oplismenus Crus-galli, *L.* (Africa, America).
Oplismenus stagninus, *Kth.* (Africa, America).
Chamæraphis hordeacea, *Br.*
Setaria glauca, *L.* (Africa, America).
Gymnothrix Japonica, *Kth.*
Lappago racemosa, *Willd.* (Africa, America).
Spinifex squarrosus, *L.*
Sporobolus commutatus, *Br.* (Africa, America).
Polypogon Monspelianus, *L.* (Africa, America).
Phragmites communis, *L.* (Africa, America).
Microchloa setacea, *Br.* (Africa).
Chloris barbata, *Sw.* (Africa, America).
Cynodon Dactylon, *L.* (Africa, America).
Dactyloctenium Ægyptiacum (Africa, America).
Leptochloa cynosuroides, *R. & S.* (Afr., Amer.).
Leptochloa filiformis, *R. & S.* (Africa, America).
Eleusine radulans, *Br.*
Gymnopogon digitatus, *Nees.*
Eragrostis Zeylanica, *Nees.*
Eragrostis Brownii, *Nees* (Africa).
Eragrostis verticillata, *P. B.* (Africa, America).
Glyceria fluitans, *L.* (Africa, America).
Kœleria cristata, *L.* (Africa, America).

Elytrophorus articulatus, *P. B.* (Africa).
Ophiurus corymbosus, *Gærtn.*
Rottbœllia exaltata, *L.* (Africa).
Manisuris granularis, (Africa, America).
Hemarthria compressa, *Br.* (Africa, America).
Imperata arundinacea, *Cyril.* (Africa, America).
Heteropogon contortus, *L.* (Africa, America).
Sorghum Halepense, *L.* (Africa, America).
Ischæmum ciliare, *Nees.*
Andropogon annulatus, *Forsk.* (Africa).
Andropogon pertusus, *Willd.* (Africa).
Andropogon Ischæmum, *Nees* (Africa, America).
Andropogon striatus, *Willd.?* (Africa).
Spodiopogon angustifolius, *Tr.*
Chrysopogon acicularis, *L.* (Africa).
Chrysopogon Gryllus, *L.* (Africa).
Zoysia pungens, *Willd.* (Africa).
Arundinella miliacea, *Nees* (Africa, America).

This catalogue offers many points worthy of discussion, but which it would be beyond the object and scope of this Essay to discuss. The Indian botanist will recognize the double element, one consisting of a littoral and the other of an inland Flora, the former prevalent over the shores of both Indian peninsulas, the Malay and Philippine islands, and, to a certain extent, the Louisiade and Western Pacific groups; the other or inland Indian Flora characteristic of the Carnatic, the sandstone table-lands of the western Peninsula of India, and which reappears in the Upper Birma valley, where the climate of this becomes dry for a considerable portion of the year. A list of representative Indian species would have added greatly to its value, as further establishing the close relationship between endemic Floras of central Australia and central India, for it would include many species of the following conspicuous Indian genera which are not enumerated in the foregoing list :—

Wormia.	Desmodium.	Gardenia.	Plectranthus.
Cocculus.	Agati.	Randia.	Anisomeles.
Nymphæa.	Clitoria.	Petunga.	Endiandra.
Cleome.	Canavalia.	Spermacoce.	Cryptocarya.
Phoberos.	Mucuna.	Adenostemma.	Claoxylon.
Adansonia.	Erythrina.	Maba.	Sponia.
Sterculia.	Brachypterum.	Diospyros.	Pouzolzia.
Cochlospermum.	Pongamia.	Olea.	Urostigma.
Limonia.	Flemingia.	Bæobotrys.	Ficus.
Micromelon.	Mezoneuron.	Jasminum.	Crinum.
Clausenia.	Phanera.	Villarsia.	Curculigo.
Olax.	Neptunia.	Carissa.	Asparagus.
Cupania.	Pithecolobium.	Tabernæmontana.	Smilax.
Turræa.	Grislea.	Wrightia.	Calamus.
Xanthoxylon.	Lawsonia.	Sarcostemma.	Areca.
Celastrus.	Eugenia.	Tylophora.	Corypha.
Elæodendron.	Zanonia.	Marsdenia.	Leptaspis.
Ventilago.	Zehneria.	Breweria.	Cenchrus.
Semecarpus.	Luffa.	Physalis.	Aristida.
Canarium.	Cucumis.	Limnophila.	Dimeria.
Psoralea.	Modecca.	Gmelina.	Anthistiria.
Tephrosia.	Loranthus.	Tecoma.	Ratzeburgia.
Sesbania.	Viscum.	Spathodia.	

Another point is the much larger proportion of Monocotyledons than of Dicotyledons; of the former class fully one-third of all the tropical species are also found in India, of the latter not one-

fifth. The number of arboreous and shrubby plants is very considerable, showing that this portion of the Flora is not wholly made up of transported weeds.

Lastly, I have to allude to the remarkable absence of any reciprocity between the vegetation of Australia and India, for though I have given nearly 500 Indian species, and upwards of 200 genera, that are very decidedly Indian types of vegetation, I am not aware of a single Australian species in central India or in the western Indian peninsula, or one Australian genus that is common there. The only Australian genera that are found in any part of India proper are *Stylidium* (of which a very few species are found in the eastern Peninsula, and one in eastern Bengal, Ceylon, and the country near Calcutta), *Lagenophora* and *Haloragis*, which are temperate forms, and the following, which are confined in India to the Malayan Peninsula, or the country immediately adjoining it.

Philydrum.	Casuarina.	Tristania.	Metrosideros.
Dacrydium.	Leucopogon.	Leptospermum.	

To the eastward of India again *Bæckia* attains the latitude of southern China and the Philippines. *Microtis rara* inhabits New Zealand, Java, and Bonin; *Thelymitra* is also Javanese; a species of *Stackhousia* is found in the Philippines; one of the Indian Stylidiums inhabits Hongkong, and *Carex littorea* (an extra-tropical plant) is a native of Japan.

According to the hitherto prevailing theory of the distribution of plants, this presence of so many Indian species in tropical Australia would be accounted for by trans-oceanic migration, but this theory offers no explanation of the total absence of Australian species and typical genera in the tropical parts of India. *Eucalyptus, Acacia, Stylidium,* and *Goodeniaceæ,* are characteristic of tropical as well as of temperate Australia, together with various peculiar genera of *Leguminosæ, Compositæ, Myrtaceæ, Myoporineæ, Loganiaceæ, Restiaceæ, Coniferæ,* and *Orchideæ,* which are not represented in tropical India.

Some of these genera (*Acacia, Eucalyptus,* and *Casuarina*) flourish when planted in the Peninsula of India, and it would be interesting to know whether they become naturalized, for it appears to me to be difficult to conceive that there should be anything in the condition of the soil, vegetation, or climate of India that would wholly oppose the establishment of Australian plants, had they been transported thither by natural causes now in operation; and I cannot suppose that there should have been no migration from Australia to India if there was such a migration in the opposite direction as would account for so great a community of vegetation between these continents.

§ 6.

On the Flora of Extra-tropical Australia.

In studying the extra-tropical Flora of Australia, the first phenomenon that attracts attention is the remarkable difference between the eastern and western quarters, to which there is nothing analogous in the tropical region. What differences there are between eastern and western tropical Australia are confined to more Asiatic forms in the latter, and more Polynesian and temperate Australian ones in the former; this is analogous to that preponderance, to which I shall hereafter allude, of the South African types in south-western Australia, and of New Zealand and Antarctic ones in south-eastern; but offers nothing analogous to the fact that the species, and in a great extent the genera, of south-western Australia differ from those of south-eastern, though these species and

genera belong to the same Natural Orders, and in many cases to peculiarly Australian Orders or divisions of Orders.

I have endeavoured to estimate this difference by tabulating the genera and species of each country, and though the results must, in the present state of our knowledge, be very vague, they may serve to give an approximate idea of the amount of difference, which it is all the more important to do because I believe the phenomenon to be without a parallel in the geography of plants. These Floras I estimate as containing about—

South-western.		*The South-eastern Flora, including Tasmania.*	
Natural Orders	90	Natural Orders	125
Genera	600	Genera	700
Species	3,600	Species	3,000

As far as I can make out, about one-fifth of the south-eastern species are found beyond that area; but only one-tenth of them are found in south-western Australia.

I need not remind my readers that these countries are in the same parallel of latitude, are not remarkably different in physical conditions, or indeed by any means so different as others (Greece and Spain for example) that present no such contrast, and that the extreme distance between them is only 1700 miles, with continuous land throughout. What differences there are in conditions would, judging from analogy with other countries, favour the idea that south-eastern Australia, from its far greater area, many large rivers, extensive tracts of mountainous country and humid forests, would present much the most extensive Flora, of which only the drier types could extend into south-western Australia. But such is not the case altogether, for though the far greater area is much the best explored, presents more varied conditions, and is tenanted by a larger number of Natural Orders and genera, these contain fewer species by several hundreds.

Of the largest genera of south-eastern and south-western Australia there are very few species common to both countries, as the following list, arranged in order of their magnitude, will show.*

South-eastern Australia.

	Species.	Sp. found in S.W.		Species.	Sp. found in S.W.
Acacia	133	0	Melaleuca	27	0
Grevillea	67	0	Helichrysum	25	3
Eucalyptus	55	0	Brachycome	24	4
Pultenæa	50	0	Xerotes	24	0
Leucopogon	50	0	Prasophyllum	23	2
Persoonia	40	0	Pterostylis	22	2
Eurybia	36	1	Senecio	20	4
Pimelea	35	1	Hibbertia	18	0
Epacris	34	0	Phebalium	17	0
Prostanthera	30	0	Bossiæa	17	1
Goodenia	30	0	Carex	17	6
Hakea	28	1	Ozothamnus	17	0
Boronia	27	0	Pleurandra	16	0

* This list is very far from complete, but is in so far founded on exact data as that I have satisfied myself of the whole number of species alluded to in the first column of figures being absent in the collections I have examined from south-west Australia, except when otherwise stated. Future observations will no doubt modify its details without vitiating the general result.

	Species.	Sp. found in S.W.
Lepidosperma	16	2
Daviesia	16	0
Bæckia	16	0
Haloragis	15	2
Cryptandra	15	0
Pomaderris	15	0
Banksia	15	0
Trichinium	15	1
Cyperus	15	1
Dampiera	14	2
Isolepis	14	6
Dodonæa	13	1
Gompholobium	13	0
Dillwynia	13	1
Cassinia	13	0
Veronica	13	1
Utricularia	13	1
Hydrocotyle	12	2
Loranthus	12	1
Asperula	12	0
Lobelia	12	3
Plantago	12	3
Polygonum	12	3
Conospermum	12	0
Caladenia	12	1
Sida	11	1
Astrotriche	11	0
Galium	11	1
Stylidium	11	0

South-western Australia.

	Species.	Sp. found in S.E.
Melaleuca	100	0
Acacia	99	0
Stylidium	78	0
Hakea	75	1
Grevillea	74	0
Leucopogon	70	0
*Dryandra	53	0
Daviesia	48	0
*Petrophila	46	0
Eucalyptus	46	0
*Verticordia	43	0
Dampiera	38	2
Banksia	38	0
Lepidosperma	36	2
Drosera	35	0
*Jacksonia	31	0
*Calothamnos	30	0
*Gastrolobium	28	0
Calycothrix	28	0
Trichinium	27	1
*Isopogon	27	0
Pimelea	27	1
Boronia	26	0
Conospermum	26	0
Schœnus	26	2
Persoonia	25	0
*Conostylis	23	0
Xerotes	23	0
*Chorizema	22	0
*Hemigenia	21	0
*Candollea	20	0
Hibbertia	20	0
Comesperma	20	2
Tetratheca	20	1
Dodonæa	20	1
Restio	20	0
Trymalium	20	0
Oxylobium	20	0
Goodenia	20	0
Merkiusa	20	1
Caladenia	20	1
*Astroloma	18	0
*Andersonia	18	0
Leptomeria	18	1
Thysanotus	18	1
*Thomasia	17	0
*Genethyllis	16	0
Eurybia	16	1
*Leschenaultia	16	0
Logania	16	0
Patersonia	16	0
Chætospora	16	1
Gompholobium	15	0
Pultenæa	15	0
Bossiæa	15	1
*Chamælaucium	15	0

	Species.	Sp. found in S.E.
*Adenanthos	15	0
*Beaufortia	14	0
*Agonis	14	0
Phebalium	13	1
*Hypocalymna	13	0
Trachymene	13	0
Podolepis	13	1
*Anarthria	13	0
Opercularia	12	0
Myoporum	12	0
Atriplex	12	3
Cassytha	12	1
Thelymitra	12	5
*Sphærolobium	11	0
*Eutaxia	11	0
Haloragis	11	2
*Astartea	11	0
Xanthosia	11	0
Helichrysum	11	3
*Halgania	11	0
*Microcorys	11	0
Rhagodia	11	2
*Synaphea	11	0
Casuarina	11	1
*Viminaria	11	0

This instructive table puts the most important differential features of south-eastern and south-western Australia prominently before the eye, and I would point out:—1. How greatly larger the genera of the south-western Flora are, there being 80 genera with upwards of 10 species in its column, and only 55 in the south-eastern. 2. That the 55 genera of the south-eastern Flora contain about 1,260 species, and the 55 highest of the south-western 1,727 species. 3. That of these 55 south-western genera 36 do not appear at all in the south-eastern list, and 17 (marked with a *) are absolutely confined to the south-west, or almost so.

Altogether, I find the proportion of genera to species in the south-western Flora to be 1:6, and in the south-eastern 1:4. This increased number of genera in south-eastern Australia over the south-western is mainly due to the presence of more Antarctic, European, New Zealand, and Polynesian genera in the south-east, to which I shall hereafter allude.

The proportion of species belonging to peculiar or endemic genera in the south-west is about one-third of the whole, and in the south-east one-sixth.

The proportion of species common to other countries in the south-west is about one-tenth of the Flora, and in the south-east one-sixth.

There are about 180 genera, out of about 600, in south-western Australia that are either not found at all in south-eastern, or that are represented there by a very few species only, and these 180 genera include nearly 1,100 species.

Of generally diffused Australian genera that are absent in the south-west, I find *Viola*, *Polygala*, *Epacris*, *Lycopus*, *Ajuga*, *Smilax*, and *Eriocaulon*; and of European genera which occur in that quarter, but which I have not seen from elsewhere in Australia, are *Echinospermum*, *Eritrichium*, *Orobanche*, *Althenia*, and *Lepturus*, several of which I suppose to be introduced, and, if so, will soon be found in other colonies.

This curious case of great differences in the genera and species of the two quarters of a small continent, accompanied by an increased number of species in the smaller and more isolated quarter of the continent, which is, further, by far the most uniform in physical conditions, will no doubt eventually be found to offer the best means of testing whatever theory of creation and distribution may be established. In the meantime, the theories which I have sketched in the early pages of this Essay cannot, in the present state of our geological knowledge of Australia, be brought to bear fully upon it. That no Natural Order, but that many genera, and a whole Flora of species, should

be created in the smaller and more isolated area of western Australia, different from what eastern Australia presents, seems at first sight favourable to the idea that these are derivative genera and species, formed during the gradual migration of certain of the Orders and Genera of the east towards the west. But on the other hand, this massing of most of the peculiar features of the Australian Flora in the west, unmixed there with Polynesian, Antarctic, or New Zealand genera, is an argument for regarding western Australia as the centrum of Australian vegetation, whence a migration proceeded eastward; and the eastern genera and species must in such a case be regarded as the derivative forms. Had we any idea of the comparative geological age of eastern and western Australia, this inquiry might be proceeded with a little further; though even then it would be soon brought to a standstill, by the necessity of determining the antecedents of the whole Australian Flora. This Flora, though manifestly more allied to the Indian than to any other, differs from it so organically, that it is impossible to look upon one as derived from the other, though both may have had a common parentage.

The local character of the south-western Australian plants is another singular feature that must not be overlooked in any inquiry as to the relative ages of countries and their vegetation. So singularly circumscribed are its species in area, that many are found in one spot alone, and, of some Natural Orders, the species of Swan River differ very much from those of King George's Sound. I am quite at a loss to offer any plausible reason for this rapid succession of forms in area, and the contrast in this respect between the south-western and eastern districts is all the more remarkable, because the latter also, as compared with other parts of the world, presents a very considerable assemblage of local species. But so it is, that there are far more King George's Sound species absent from the Swan River, though separated by only 200 miles of tolerably level land, than there are Tasmanian plants absent from Victoria, which are as many miles apart, and separated by an oceanic strait. It would indeed appear that the mixture of several Floras of different character in one area tends to keep down the total number of species in that area, and if so, we may connect the richness in species of the western Australian Flora with its singular uniformity of character, for it is purely Australian, without admixture of any other element. As this excessive multiplication must, under the theory of creation by variation, have occupied a great length of time, it seems to be more natural to assume, on purely botanical grounds, that the western Australian Flora is the earliest, and sent colonists to the eastern quarter, where they became mixed with Indian, Polynesian, etc., colonists, than that the western Flora was peopled by one section only of the inhabitants of the eastern quarter.

So much for the botanical aspect of the question. The geological one suggests a different explanation. That part of the Australian continent which alone is clothed with any considerable amount of vegetation, may be likened to a horse-shoe of more or less elevated land, with its convexity to the north, and a vast enclosed central depressed area, that opens to the sea on the south, and advances north almost to the Gulf of Carpentaria. According to Mr. Jukes's clever 'Sketch of the Physical Structure of Australia,' this central and southern area was recently an oceanic bay, and existing species of Mollusca are found on its surface for many miles along the coast, and inland from it, in an almost unchanged condition.* To the east of this depressed area, the mountains are far loftier and the rocks of a much greater age than to the west of it; and were the question of the age of the Floras comprised in that of the rocks they inhabit, little doubt would be enter-

* Great beds of shells, with the colours retained, are found at Jurien Bay, at forty to eighty feet above the sea-level. (Von Sommer, in Quart. Journ. Geol. Soc. v. p. 52.)

tained that the western one was modern and derivative; but in no other part of the world are recently-formed lands tenanted exclusively by endemic plants, nor do they present assemblages of very local species; on the contrary, they are inhabited by many individuals of a few species derived from surrounding countries, of which some few are so altered as to be distinguished as varieties or even species; and we cannot therefore accept the geological evidence as good for explaining the botanical phenomena.

There is another way of viewing the whole question, but one so purely speculative that I hesitate to put it forward. It is that the antecedents of the peculiar Australian Flora may have inhabited an area to the westward of the present Australian continent, and that the curious analogies which the latter presents with the South African Flora, and which are so much more conspicuous in the south-west quarter, may be connected with such a prior state of things.

§ 7.

On the Flora of Countries around Spencer's Gulf.

South Australia, which now ranks as a distinct colony, has been but imperfectly explored, and is apparently very poor in species. Some notices of its botany will be found in Lindley's and Hooker's Appendices to Mitchell's Journeys; in Brown's 'Appendix to Sturt's Journey;' in Hooker's 'Kew Miscellany,' 1853, p. 105; and, more recently, in Mueller's Report on the plants collected by Mr. D. Hergolt during Babbage's expedition. They all show that the character of the Flora is intermediate between the south-eastern, south-western, and tropical Floras, the eastern being perhaps the dominant, and the tropical due to the proximity of the central desert.

Amongst the western genera and species which here approach their eastern limits are *Hibiscus hakeæfolius* and *multifidus*, *Cyanothamnus*, *Sollya heterophylla*, *Cheiranthera*, *Bossiæa sulcata*, *Templetonia retusa*, *Clianthus Dampieri*, *Nitraria Billardieri*, *Adenanthera terminalis*, *Podotheca*, *Cylindrosorus flavescens*, *Logania crassifolia*, *Anthocercis anisantha*, *Cyclotheca australica*, and *Codonocarpus acaciæformis?*

The tropical element is displayed by species of *Crotalaria*, *Polycarpæa*, *Monenteles*, *Pluchea*, *Glossogyne*, *Sarcostemma*, *Trichodesma*, *Rostellularia*, and *Santalum*. Mueller further alludes to a succulent, leafless *Euphorbia*, probably of the Indian or South African type. The absence or rarity of *Proteaceæ*, *Sophoreæ*, *Myrtaceæ*, *Diosmeæ* and *Epacrideæ*, and prevalence of *Compositæ*, *Eremophila*, *Zygophylleæ* and *Salsoleæ*, are other proofs of the tropical and desert character of the South Australian Flora.

From the examination of a considerable collection of South Australian species made by Messrs. Whitaker, Dutton, Hillebrandt, etc., I am inclined to suspect that it contains so few peculiar genera, and so large a number of species which are either identical with or strictly intermediate in character between eastern and western ones, or which are so closely allied to congeners of one or the other, that they will favour the idea of the Flora being to a very great extent derivative.

§ 8.

On the Tasmanian Flora.

For an account of the physical features of Tasmania, in so far as they affect the vegetation, I must refer to Strzelecki's excellent 'Physical Description of New South Wales and Van Diemen's Land,' where the relations of the forest to the soil and elevation, and of all these features in Tasmania to those of south-eastern Australia, are well portrayed.

The primary feature of the Tasmanian Flora is its identity in all its main characters with the Victorian, and especially of the mountainous parts of that colony; it differs only in having fewer orders, genera, species, more Antarctic and New Zealand elements, and fewer tropical, all of which might be expected from its geographical position and its climate, which is much more equable and humid than any district of Australia. There is, indeed, one part of Victoria, viz. Wilson's promontory, of which the vegetation is described as peculiarly Tasmanian, and a glance at the map shows that here again geographical proximity and uniformity of vegetation go together. There are besides a very few south-western Australian types in Tasmania, that have not also been found in the eastern Australian continent.

Before proceeding with the analysis of the Tasmanian Flora, I shall give a list of the species, with the distribution of each, and indicate the Floras of which each genus may be considered most strongly representative. These are:—1. The Australian continent; 2. New Zealand and Polynesia; 3. The Antarctic Islands; 4. South American; 5. Europe (including North America, North Asia, and North India, in so far as these share European features). Many species may be classed under two or more of these divisions, as *Anemone*, which is absent in Australia and New Zealand, but is Antarctic, American, and European. I have also put an asterisk to every species considered by Mueller, Archer, or myself as probably a variety, and noted which are subalpine and alpine. Mr. Archer has further revised the list, and added "Ch." to every species found within fifteen miles of Cheshunt.

DICOTYLEDONS.

I. *Ranunculaceæ*.

	Distribution of Species.	Distr. of Genera or representatives.
1. Clematis coriacea, *DC.* Ch.	Australia	Europe, etc.
2. Clematis *blanda, *Hook.*	"	
3. Clematis *gentianoides, *DC.*	Tasmania.	
4. Clematis linearifolia, *Steud.*	Australia.	
5. Anemone crassifolia, *Hook.*	Tasmania (subalp.)	Europe, South America.
6. Ranunculus aquatilis, *L.* Ch.	Tasmania, temp. zone	Europe, etc.
7. Ranunculus Gunnianus, *Hook.* Ch.	Austral. (subalp.)	
8. Ranunculus hirtus, *B. & S.* Ch.	"	N. Zeal.
9. Ranunculus lappaceus, *Sm.* Ch.	"	" S. Africa.
10. Ranunculus *scapigerus, *Hook.* Ch.	Tasmania (subalp.).	
11. Ranunculus *nanus, *Hook.* Ch.	"	"
12. Ranunculus *glabrifolius, *Hook.* Ch.	"	
13. Ranunculus *inconspicuus, *Hook.* Ch.	"	
14. Ranunculus *cuneatus, *Hook.* Ch.	"	(Alp.)

	Distribution of Species.	Distr. of Genera or representatives.
15. Ranunculus inundatus, *Br.* Ch.	Australia.	
16. Ranunculus sessiliflorus, *Br.* Ch.	„	N. Zealand.
17. Ranunculus *Pumilio, *Br.*	Australia.	
18. Caltha introloba, *Muell.* Ch.	„	Europe, etc., S. America.
II. *Magnoliaceæ.*		
19. Tasmannia aromatica, *Br.* Ch.	Australia (subalp.)	N. Zealand, Fuegia, Borneo.
III. *Monimiaceæ.*		
20. Atherosperma moschata, *Br.* Ch.	Australia	N. Zealand, South America.
IV. *Dilleniaceæ.*		
21. Hibbertia procumbens, *DC.* Ch.	Tasmania	Australia.
22. Hibbertia fasciculata, *Br.* Ch.	Australia.	
23. Hibbertia virgata, *Br.*	„	
24. Hibbertia ericæfolia, *H.f.*	Tasmania.	
25. Pleurandra acicularis, *Lab.*	Australia	Australia.
26. Pleurandra sericea, *Br.*	„	
27. Pleurandra ovata, *Lab.* Ch.	„	
28. Pleurandra riparia, *Br.* Ch.	„	
29. Pleurandra hirsuta, *Hook.*	Tasmania.	
V. *Cruciferæ.*		
30. Cardamine radicata, *H.f.* Ch.	Tasmania (alp.)	Europe, etc.
31. Cardamine stylosa, *DC.* Ch.	Australia.	
32. Cardamine dictyosperma, *Hook.* Ch.	„	
33. Cardamine pratensis, *L.* Ch.	„	Europe,
34. Cardamine hirsuta, *L.* Ch.	„	ubiquitous.
35. Barbarea australis, *H.f.* Ch.	„	New Zealand . . Europe, etc.
36. Nasturtium terrestre, *Br.* Ch.	„	ubiquitous . . . Europe, etc.
37. Stenopetalum lineare, *Br.*	„	Australia.
38. Hutchinsia procumbens, *Br.*	„	Europe . . . . Europe, etc.
39. Hutchinsia australis, *H.f.*	„	
40. Thlaspi ? Tasmanicum, *H.f.*	Tasmania (subalp.)	Europe, etc.
41. Draba nemoralis, *L.*	Europe	Europe, South America.
42. Draba Pumilio, *Br.*	Tasmania.	
43. Lepidium cuneifolium, *DC.*	Australia	Europe, etc.
44. Lepidium ruderale, *L.* Ch.	„	ubiquitous.
45. Lepidium foliosum, *Desv.*	„	
VI. *Violariæ.*		
46. Viola hederacea, *Lab.*	Australia	Europe, etc.
47. Viola betonicæfolia, *Sw.* Ch.	„	
48. Viola Cunninhamii, *H.f.* Ch.	New Zealand (subalp.).	
49. Viola Caleyana, *Don.* Ch.	Australia.	
50. Hymenanthera angustifolia, *Br.* Ch.	„	Australia, New Zealand.

VII. *Droseraceæ.*

	Distribution of Species.	Distr. of Genera or representatives.
51. Drosera Arcturi, *Hook.* Ch.	Austral., N. Zeal. (subalp.)	Europe, South Africa, etc.
52. Drosera pygmæa, *DC.*	„	„
53. Drosera spathulata, *Lab.*	„	„ India.
54. Drosera binata, *Lab.* Ch.	„	„
55. Drosera Planchoni, *H.f.*	„	
56. Drosera auriculata, *Back.* Ch.	„	New Zealand.
57. Drosera peltata, *Sw.*	„	„
58. Drosera gracilis, *H.f.* Ch.	Tasmania (subalp.).	
59. Drosera foliosa, *H.f.*	Australia.	

VIII. *Polygaleæ.*

60. Comesperma volubilis, *Lab.* Ch. . . .	Australia	Australia.
61. Comesperma retusa, *Lab.* Ch.	„	
62. Comesperma ericina, *DC.*	„	
63. Comesperma calymeja, *Lab.*	„	

IX. *Tremandreæ.*

64. Tetratheca ciliata, *Lindl.*	Australia	Australia.
65. Tetratheca glandulosa, *Lab.* Ch. . . .	„	
66. Tetratheca pilosa, *Lab.* Ch.	„	
67. Tetratheca *procumbens, *Gunn.* Ch. . .	Tasmania.	
68. Tetratheca *Gunnii, *H.f.*	„	

X. *Pittosporeæ.*

69. Billardiera longiflora, *Lab.* Ch. . . .	Australia	Australia.
70. Billardiera mutabilis, *Lab.* Ch. . . .	„	
71. Billardiera *macrantha, *H.f.*	Tasmania.	
72. Pittosporum bicolor, *Hook.* Ch. . . .	Australia	India, etc.
73. Bursaria spinosa, *Cav.* Ch.	„	Australia.
74. Bursaria procumbens, *Putt.*	„	

XI. *Frankeniaceæ.*

75. Frankenia pauciflora, *DC.*	Australia	Europe, etc.

XII. *Caryophylleæ.*

76. Spergularia rubra, *St. Hil.*	Australia (ubiquitous) . .	Europe, etc.
77. Scleranthus biflorus, *H.f.* Ch.	„ New Zealand . .	Europe, etc.
78. Scleranthus *fasciculatus, *H.f.* Ch. . .	Tasmania (subalp.).	
79. Scleranthus diander, *Br.* Ch.	Australia.	
80. Colobanthus Billardieri, *Fenzl*	New Zealand	New Zealand, Antarctic.
81. Colobanthus *affinis, *H.f.* Ch.	Tasmania (subalp.).	
82. Stellaria multiflora, *Hook.*	Australia, New Zealand . .	Europe, etc.
83. Stellaria media, *Sw.* Ch.	„	Europe, Antarctic.
84. Stellaria glauca, *With.* Ch.	„	Europe.
85. Stellaria pungens, *Brongn.* Ch. . . .	„	

XIII. *Lineæ.*

	Distribution of Species.	Distr. of Genera or representatives.
86. Linum marginale, *A.C.* Ch.	Australia	Europe, etc.

XIV. *Elatineæ.*

87. Elatine Americana, *Arn.* Ch.	Austral., N. Zeal., N. Amer.	Europe, etc.

XV. *Malvaceæ.*

88. Lavatera plebeja, *Sims*	Australia	Europe, etc.
89. Lawrencia spicata, *Hook.*	„	Australia.
90. Plagianthus pulchellus, *A. Gray.* Ch.	„	Australia, New Zealand.
91. Plagianthus sidoides, *Hook.*	„	

XVI. *Buettneriaceæ.*

92. Lasiopetalum discolor, *Hook.*	Tasmania	Australia.
93. Lasiopetalum Gunnii, *Steetz*	„	
94. Lasiopetalum micranthum, *H.f.*	„	

XVII. *Elæocarpeæ.*

95. Aristotelia peduncularis, *H.f.* Ch.	Tasmania (subalp.)	Austr., N. Zeal., S. Amer.

XVIII. *Hypericineæ.*

96. Hypericum gramineum, *Forst.* Ch.	Aust., N. Zeal., India? S. Af.?	
97. Hypericum *Japonicum, *Thunb.* Ch.	„ „ „	„
98. Eucryphia lucida, *Spach.* Ch.	Tasmania (subalp.)	South America.
99. Eucryphia *Milligani, *H.f.*	„	„

XIX. *Sapindaceæ.*

100. Dodonæa viscosa, *Forst.*	Aust., N. Zeal., ubiq.	Trop. India, etc.
101. Dodonæa salsolæfolia, *A.C.*	Australia.	

XX. *Geraniaceæ.*

102. Geranium dissectum, *L.*, var.	Aust., N. Zeal., Eur., Amer.	Europe, etc.
103. Geranium *potentilloides, *L'Hérit.*	„	„
104. Geranium brevicaule, *Hook.* Ch.	Austral., N. Zeal. (subalp.)	
105. Pelargonium australe, *Willd.* Ch.	Australia, South Africa?	Australia, South Africa.
106. Pelargonium *Acugnaticum, *Pet. Th.* Ch.	New Zealand, South Africa.	

XXI. *Oxalideæ.*

107. Oxalis Magellanica, *Forst.* Ch.	N. Zeal., Antarct. (subalp.)	Europe, etc.
108. Oxalis corniculata, *L.*	ubiquitous.	

XXII. *Zygophylleæ.*

109. Rœpera Billardieri, *A. Juss.*	Australia	Australia.
110. Rœpera latifolia, *H.f.*	„	

XXIII. *Rutaceæ.*

111. Correa rufa, *Gærtn.*	Australia	Australia.
112. Correa Backhousiana, *Hook.*	„	

	Distribution of Species.	Distr. of Genera or representative.
113. Correa Lawrenciana, *Hook.* Ch.	Australia.	
114. Correa speciosa, *Andr.*	„	
115. Phebalium Billardieri, *A. Juss.* Ch.	„	Australia, New Zealand.
116. Phebalium montanum, *Hook.*	Tasmania (alpine).	
117. Phebalium truncatum, *H.f.* Ch.	Australia ?	
118. Phebalium Daviesii, *H.f.*	Tasmania.	
119. Eriostemon verrucosum, *A. Rich.*	Australia	Australia.
120. Eriostemon virgatum, *A. Cunn.*	„	
121. Zieria lanceolata, *Br.* Ch.	„	Australia.
122. Boronia rhomboidea, *Hook.* Ch.	Tasmania	Australia.
123. Boronia pilonema, *Lab.* Ch.	Australia.	
124. Boronia hyssopifolia, *Sieb.* Ch.	„	
125. Boronia pilosa, *Lab.* Ch.	„	
126. Boronia variabilis, *Hook.* Ch.	„	
127. Boronia *Gunnii, *H.f.* Ch.	Tasmania.	
128. Boronia *citriodora, *Gunn.* Ch.	„	
129. Boronia *dentigera, *F. Muell.*	Australia.	
130. Acradenia Franklinіæ, *Kippist*	Tasmania	Tasmania.

XXIV. *Rhamneæ.*

131. Discaria australis, *Hook.* Ch.	Australia, New Zealand	Aust., N. Zeal., S. Amer.
132. Cryptandra obcordata, *H.f.*	Tasmania	Australia.
133. Cryptandra vexillifera, *Hook.*	Australia.	
134. Cryptandra Lawrencii, *H.f.*	Tasmania.	
135. Cryptandra eriocephala, *H.f.*	„	
136. Cryptandra ulicina, *Hook.*	„	
137. Cryptandra Gunnii, *H.f.*	„	
138. Cryptandra mollis, *H.f.*	Australia.	
139. Cryptandra ? parvifolia, *H.f.*	Tasmania.	
140. Cryptandra obovata, *H.f.*	„	
141. Cryptandra Sieberi, *Fenzl*	Australia.	
142. Cryptandra alpina, *H.f.* Ch.	Tasmania (alpine).	
143. Cryptandra pimeleoides, *H.f.*	„	
144. Pomaderris elliptica, *Lab.* Ch.	Australia, New Zealand	Australia, New Zealand.
145. Pomaderris *discolor, *Vent.*	„	
146. Pomaderris ferruginea, *Fenzl*	„	
147. Pomaderris apetala, *Lab.* Ch.	„	
148. Pomaderris racemosa, *Hook.*	Tasmania.	
149. Pomaderris ericæfolia, *Hook.*	New Zealand.	

XXV. *Stackhousieæ.*

150. Stackhousia monogyna, *Lab.* Ch.	Australia	Aust., N. Zeal., Philippines.
151. Stackhousia *Gunnii, *H.f.* Ch.	„	
152. Stackhousia maculata, *Sieb.*	„	
153. Stackhousia flava, *H.f.*	Australia ?	

XXVI. *Leguminosæ.*

Podalyrieæ.

	Distribution of Species.	Distr. of Genera or representatives.
154. Oxylobium arborescens, *Br.* Ch.	Australia	Australia.
155. Oxylobium ellipticum, *Br.* Ch.	Tasmania.	
156. Gompholobium latifolium, *Sm.*	Australia	Australia.
157. Daviesia umbellulata, *Sm.* Ch.	„	Australia.
158. Daviesia latifolia, *Br.* Ch.	„	
159. Aotis villosa, *Curt.* Ch.	„	Australia.
160. Sphærolobium vimineum, *Sm.* Ch.	„	Australia.
161. Dillwynia glaberrima, *Sm.* Ch.	Australia	Australia.
162. Dillwynia floribunda, *Sims*	„	
163. Dillwynia cinerascens, *Br.* Ch.	„	
164. Pultenæa daphnoides, *Ser.*	„	Australia.
165. Pultenæa stricta, *Sims*	„	
166. Pultenæa subumbellata, *Hook.*	„	
167. Pultenæa *selaginoides, *H.f.*	Tasmania.	
168. Pultenæa *pimeleoides, *H.f.*	„	
169. Pultenæa Gunnii, *Benth.* Ch.	„	
170. Pultenæa dentata, *Lab.* Ch.	Australia.	
171. Pultenæa prostrata, *Benth.*	„	
172. Pultenæa Hibbertioides, *H.f.*	„	
173. Pultenæa juniperina, *Lab.* Ch.	„	
174. Pultenæa *cordata, *Hook.*	„	
175. Pultenæa diffusa, *H.f.*	Tasmania.	
176. Pultenæa pedunculata, *Hook.*	Australia.	
177. Pultenæa humilis, *Benth.*	Tasmania.	
178. Pultenæa tenuifolia, *Br.* Ch.	Australia.	
179. Pultenæa fasciculata, *Benth.* Ch.	„ (subalp.).	
180. Pultenæa *Bæckioides, *Benth.*	„	

Genisteæ.

181. Hovea purpurea, *Sweet*	Australia	Australia.
182. Hovea heterophylla, *A. C.* Ch.	„	
183. Bossiæa ensata, *Lab.* Ch.	„	Australia.
184. Bossiæa prostrata, *Br.*	„	
185. Bossiæa cordigera, *Benth.* Ch.	Tasmania.	
186. Bossiæa cinerea, *Br.*	Australia.	
187. Platylobium triangulare, *Br.*	„	Australia.
188. Platylobium Murrayanum, *Hook.*	„	
189. Ptalylobium formosum, *Sm.*	„	
190. Goodia lotifolia, *Sal.* Ch.	„	Australia.
191. Goodia *pubescens, *Sims.* Ch.	„	

Trifolieæ.

192. Lotus corniculatus, *L.* Ch.	Australia, Europe	Europe, etc.
193. Lotus australis, *Andr.*	„ Polynesia.	

GALEGEÆ.

	Distribution of Species.	Distr. of Genera or representatives.
194. Psoralea Gunnii, *H.f.*	Australia	S. Amer. (India, S. Afric.).
195. Indigofera australis, *Willd.* Ch.	„	Tropics.
196. Swainsonia Lessertiæfolia, *DC.*	„	Australia.
197. Hardenbergia ovata, *Benth.*	„	Australia.

HEDYSAREÆ.

198. Desmodium Gunnii, *Benth.* Ch.	Australia	Tropics.
199. Kennedya prostrata, *Br.* Ch.	„	Australia.
200. Leptocyamus Tasmanicus, *Benth.*	„	Australia.
201. Leptocyamus clandestinus, *Benth.* Ch.	„	

MIMOSEÆ.

202. Acacia Gunnii, *Benth.* Ch.	Australia	The phyllodineous species
203. Acacia Stuartiana, *F. Mull.* Ch.	„	are chiefly Australian.
204. Acacia diffusa, *Lindl.*	Tasmania.	
205. Acacia juniperina, *Willd.*	Australia.	
206. Acacia ovoidea, *Benth.*	„	
207. Acacia verticillata, *Willd.* Ch.	„	
208. Acacia Riceana, *Henslow*	„	
209. Acacia axillaris, *Benth.*	Tasmania.	
210. Acacia myrtifolia, *Willd.* Ch.	Australia.	
211. Acacia suaveolens, *Willd.*	„	
212. Acacia crassiuscula, *Wendl.*	„	
213. Acacia verniciflua, *A. C.*	„	
214. Acacia stricta, *Willd.* Ch.	„	
215. Acacia melanoxylon, *Br.* Ch.	„	
216. Acacia linearis, *Sims.*	„	
217. Acacia mucronata, *Willd.*	„	
218. Acacia Sophoræ, *Br.*	„	
219. Acacia discolor, *Willd.*	„	
220. Acacia dealbata, *Lind.* Ch.	„	
221. Acacia mollissima, *Wild.*	„	

XXVII. *Rosaceæ.*

222. Rubus macropodus, *Ser.* Ch.	Australia	Europe, etc.
223. Rubus Gunnianus, *Hook.* Ch.	Tasmania (alpine).	
224. Potentilla anserina, *L.* Ch.	Australia (ubiquitous)	Europe, etc.
225. Acæna Sanguisorbæ, *Vahl.* Ch.	„	N. Zeal., Antarct. Aust., N. Zeal., S. Af., Ant.
226. Acæna ovina, *A. C.*	„	
227. Geum urbanum, *L.* Ch.	Aust., Eur., N. Zeal., Ant.	Europe, etc.
228. Geum reniforme, *Muell.*	Tasmania (alpine).	

XXVIII. *Onagrarieæ.*

229. Epilobium tenuipes, *H.f.*	Tasmania (alpine)	Europe, etc.
230. Epilobium pallidiflorum, *Sol.* Ch.	New Zealand.	
231. Epilobium *Billardierianum, *Ser. MS.* Ch.	Australia, New Zealand.	
232. Epilobium tetragonum, *L.* Ch.	Austr., N. Zeal., Ant., Eur.	

	Distribution of Species.	Distr. of Genera or representatives.
233. Epilobium *glabellum, *Forst.* Ch	. New Zealand.	
234. Epilobium *junceum, *Forst.* Ch.	. Austral., N. Zeal., S. Amer.	
235. Œnothera Tasmanica, *Hf.*	Tasmania (alpine)	America.

XXIX. *Haloragieæ.*

236. Haloragis pinnatifida, *A. Gray* Ch.	Australia	South temperate zone.
237. Haloragis Gunnii, *Hf.* Ch.	„	
238. Haloragis tetragyna, *Hf.* Ch.	„	New Zealand.
239. Haloragis *depressa, *A. Cunn.* Ch.	„	„
240. Haloragis micrantha, *Th.* Ch.	Aust., N. Zeal., Japan, Bengal.	
241. Myriophyllum elatinoides, *Gaud.*	Australia, N. Zeal., Antarct.	Europe, etc.
242. Myriophyllum variæfolium, *Hf.* Ch.	„	„
243. Myriophyllum amphibium, *Lab.*	„	
244. Myriophyllum pedunculatum, *Hf.* Ch.	„	
245. Myriophyllum integrifolium, *Hf.*	„	
246. Ceratophyllum demersum, *L.*	„ ubiquitous	Europe, etc.
247. Meionectes Brownii, *Hf.*	„	Australia.
248. Callitriche verna, *L.* Ch.	„ ubiquitous	Europe, etc.
249. Gunnera cordifolia, *Hf.*	Tasmania (alpine)	New Zealand, Antarctic.

XXX. *Lythrarieæ.*

250. Lythrum Salicaria, *L.* Ch.	Australia, Europe	Europe, etc.
251. Lythrum hyssopifolium, *L.*	Aust., Eur., S. Afr., S. Am.	

XXXI. *Myrtaceæ.*

252. Calycothrix glabra, *Br.*	Australia	Australia.
253. Thryptomene micrantha, *Hf.*	Tasmania	Australia.
254. Melaleuca squamea, *Lab.*	Australia	Australia, India.
255. Melaleuca pustulata, *Hf.*	Tasmania.	
256. Melaleuca ericæfolia, *Sm.*	Australia.	
257. Melaleuca squarrosa, *Sm.*	„	
258. Melaleuca gibbosa, *Lab.*	„	
259. Kunzea corifolia, *Rich.*	„	Australia.
260. Callistemon viridiflorum, *DC.* Ch.	„	Australia.
261. Callistemon salignum, *DC.* Ch.	„	
262. Eucalyptus cordata, *Lab.*	Tasmania	Australia, Malay Islands.
263. Eucalyptus Risdoni, *Hf.*	„	
264. Eucalyptus Globulus, *Lab.*	Australia.	
265. Eucalyptus coccifera, *Hf.*	Tasmania (subalp.)	
266. Eucalyptus urnigera, *Hf.*	„	„
267. Eucalyptus viminalis, *Lab.* Ch.	Australia.	
268. Eucalyptus Gunnii, *Hf.* Ch.	„	(subalp.)
269. Eucalyptus Acervula, *Sieb.*	„	
270. Eucalyptus vernicosa, *Hf.*	Tasmania (alpine).	
271. Eucalyptus amygdalina, *Lab.* Ch.	Australia.	
272. Eucalyptus coriacea, *A. Cunn.*	„	

	Distribution of Species.	Distr. of Genera or representatives.
273. Eucalyptus gigantea, *H.f.* Ch. . . .	Australia.	
274. Eucalyptus radiata, *Sieb.* Ch.	„	
275. Eucalyptus nitida, *H.f.*	Tasmania.	
276. Leptospermum scoparium, *Sm.* . . .	Australia, New Zealand .	Australia, N. Zeal., Borneo.
277. Leptospermum lanigerum, *Sm.* Ch. . .	„	
278. Leptospermum *flavescens, *Sm.* Ch. .	„	
279. Leptospermum nitidum, *H.f.*	Tasmania.	
280. Leptospermum *rupestre, *H.f.* Ch. . .	„ (alpine).	
281. Leptospermum myrtifolium, *Sieb.* Ch. .	Australia.	
282. Fabricia lævigata, *Gærtn.*	„	Australia.
283. Bæckia leptocaulis, *H.f.*	Tasmania	Australia, China, Malay.
284. Bæckia *thymifolia, *H.f.* Ch.	„	
285. Bæckia diffusa, *Sieb.*	Australia.	
286. Bæckia Gunniana, *Schauer.* Ch. . . .	Tasmania (alpine).	

XXXII. *Cucurbitaceæ.*

287. Sicyos angulatus, *L.*	Aust., N. Zeal., N. & S. Am.	Trop. Amer. and Polynesia.

XXXIII. *Portulaceæ.*

288. Calandrinia calyptrata, *H.f.* Ch. . . .	Australia	America.
289. Claytonia Australasica, *Hook.* Ch. . .	„ New Zealand . .	America.
290. Montia fontana, *L.*	N. Zeal., Europe, Antarct. .	Europe.

XXXIV. *Crassulaceæ.*

291. Tillæa verticillaris, *DC.* Ch.	Australia, N. Zeal., S. Africa	Europe, etc.
292. Tillæa purpurata, *H.f.*	„	
293. Tillæa macrantha, *H.f.*	„	
294. Tillæa recurva, *H.f.*	„	

XXXV. *Ficoideæ.*

295. Mesembryanthemum æquilaterale, *Ait.* .	Australia	South Africa.
296. Mesembryanthemum australe, *Sol.* . .	„ New Zealand.	
297. Tetragonia expansa, *Sol.*	Aust., N. Zeal., S. Am., Japan.	S. Ocean, Japan.
298. Tetragonia implexicoma, *H.f.*	Australia, New Zealand.	

XXXVI. *Cunoniaceæ.*

299. Anodopetalum biglandulosum, *A. C.* Ch.	Tasmania (subalp.) . . .	Tasmania.
300. Bauera rubioides, *Andr.* Ch.	Australia	Australia.
301. Bauera *microphylla, *Sieb.*	„	
302. ? Tetracarpæa Tasmanica, *H.f.* Ch. . .	Tasmania (alpine) . . .	Tasmania.

XXXVII. *Escallonieæ.*

303. Anopterus glandulosus, *Lab.* Ch. . .	Tasmania (subalp.) . . .	Australia.

XXXVIII. *Umbelliferæ.*

304. Hydrocotyle Asiatica, *L.* Ch. . . .	Aust., N. Zeal., Tropics, etc.	Europe, etc.
305. Hydrocotyle hirta, *Br.* Ch.	Australia.	

	Distribution of Species.	Distr. of Genera or representatives.
306. Hydrocotyle peduncularis, *Br.* Ch.	. . Australia.	
307. Hydrocotyle *Tasmanica, *H.f.* Ch.	. . „	
308. Hydrocotyle vagans, *H.f.* Ch.	. . . „	
309. Hydrocotyle pterocarpa, *Mull.*	. . . „	
310. Hydrocotyle tripartita, *Br.* Ch.	. . . „	
311. Hydrocotyle muscosa, *Br.*	. . . . . „	
312. Didiscus pilosus, *Benth.*	. . . . . „	. . . . . Aust., N. Caledon., Borneo.
313. Didiscus humilis, *H.f.* Ch.	. . . . „ (subalp.).	
314. Xanthosia montana, *Sieb.* Ch.	. . . „	. . . . . Australia.
315. Xanthosia dissecta, *H.f.*	. . . . . „	
316. Xanthosia pusilla, *Bunge*	. . . . . „	
317. Diplaspis Hydrocotyle, *H.f.* Ch.	. . „ (alpine)	. . . . Australia.
318. Diplaspis cordifolia, *H.f.*	. . . . . Tasmania (subalp.).	
319. Dichopetalum ranunculaceum, *Mull.*	. Australia (subalp.)	. . . Tasmania.
320. Hemiphues bellidioides, *H.f.*	. . . . Tasmania (alpine)	. . . Tasmania.
321. Microsciadium Saxifraga, *H.f.*	. . . . „ (subalp.)	. . . Tasmania.
322. Gingidium procumbens, *Muell.*	. . . „ (alpine)	. . . New Zealand.
323. Eryngium vesiculosum, *Lab.*	. . . . „ New Zealand	. . Europe.
324. Crantzia lineata, *Nutt.* Ch.	. . . . Aust., N. Zeal., Amer., Ant.	America, Antarctic.
325. Apium australe, *Pet. Th.*	. . . . . „ „	Antarctic . . Europe.
326. Daucus brachiatus, *Sieb.*	. . . . . „ „	N. & S. Amer. Europe.
327. Oreomyrrhis eriopoda, *H.f.* Ch.	. . Australia	. . . . . N. Zeal., S. America, Ant.
328. Oreomyrrhis brachycarpa, *H.f.* Ch.	. Tasmania (subalp.).	
329. Oreomyrrhis argentea, *H.f.*	. . . . „ „	
330. Oreomyrrhis sessiliflora, *H.f.*	. . . . „ (alpine).	
331. Oreomyrrhis ciliata, *H.f.* Ch.	. . . . „ (subalp.).	

XXXIX. *Araliaceæ.*

332. Panax Gunnii, *H.f.*	. . . . . Tasmania	. . . . . India, etc.

XL. *Caprifoliaceæ.*

333. Sambucus Gaudichaudiana, *DC.* Ch.	. Australia	. . . . . Europe, etc.

XLI. *Rubiaceæ.*

334. Coprosma hirtella, *Lab.* Ch.	. . . . Australia	. . . . . Aust., N. Zeal., Polynesia.
335. Coprosma Billardieri, *H.f.* Ch.	. . . „	
336. Coprosma nitida, *H.f.* Ch.	. . . . Tasmania (subalp.).	
337. Coprosma pumila, *H.f.* Ch.	. . . . Australia, N. Zealand (alp.).	
338. Opercularia ovata, *H.f.* Ch.	. . . . „	. . . . . Australia.
339. Opercularia varia, *H.f.* Ch.	. . . . „	
340. Nertera depressa, *B. & S.* Ch.	. . Aust., N. Z., Ant., S. Am. (alp.)	America, Antarctic.
341. Asperula subsimplex, *H.f.*	. . . . . Tasmania	. . . . . Europe, etc.
342. Asperula Gunnii, *H.f.* Ch.	. . . . Australia (subalp.).	
343. Asperula scoparia, *H.f.* Ch.	. . . . „	
344. Asperula conferta, *H.f.*	. . . . . „	
345. Asperula pusilla, *H.f.*	. . . . . Tasmania (alpine).	

	Distribution of Species.	Distr. of Genera or representatives.
346. Asperula minima, *Hf.*	Tasmania.	
347. Galium vagans, *Hf.* Ch.	Australia	Europe, etc.
348. Galium ciliare, *Hf.* Ch.	„	
349. Galium australe, *DC.* Ch.	„	
350. Galium *squalidum, *Hf.*	„	
351. Galium albescens, *Hf.*	Tasmania.	

XLII. *Compositæ.*

352. Eurybia argophylla, *Cass.* Ch.	Australia	Australia, New Zealand.
353. Eurybia viscosa, *Cass.* Ch.	„	
354. Eurybia erubescens, *DC.* Ch	„	
355. Eurybia myrsinoides, *DC.* Ch.	„	
356. Eurybia Persoonioides, *DC.* Ch.	Tasmania (subalp.).	
357. Eurybia alpina, *Hf.* Ch.	„ (alpine).	
358. Eurybia obcordata, *Hf.* Ch.	„ „	
359. Eurybia *lirata, *DC.* Ch.	Australia.	
360. Eurybia fulvida, *Cass.*	Tasmania.	
361. Eurybia *Gunniana, *DC.* Ch.	Australia.	
362. Eurybia pinifolia, *Hf.* Ch.	Tasmania (subalp.).	
363. Eurybia ledifolia, *A. C.* Ch.	„ (alpine).	
364. Eurybia linearifolia, *DC.*	Australia.	
365. Eurybia ramulosa, *DC.* Ch.	„	
366. Eurybia lepidophylla, *DC.* Ch.	„	
367. Eurybia floribunda, *Hf.*	„	
368. Eurybia glandulosa, *DC.* Ch.	„	
369. Eurybia linifolia, *Hf.*	Tasmania.	
370. Eurybia ericoides, *Steetz*	„	
371. Eurybia ciliata, *Benth.*	Australia.	
372. Celmisia longifolia, *Cass.* Ch.	„ (subalp.)	Australia, N. Zeal., Antarc.
373. Vittadinia scabra, *DC.*	„	Australia, New Zealand.
374. Vittadinia cuneata, *DC.* Ch.	„	
375. Erigeron Pappochroma, *Lab.* Ch.	Tasmania (alpine)	Europe, etc.
376. Erigeron Tasmanicum, *Hf.* Ch.	„ „	
377. Erigeron *Gunnii, *Muell.* Ch.	„ (subalp.).	
378. Brachycome decipiens, *Hf.* Ch.	Australia	Australia, New Zealand.
379. Brachycome tenuiscapa, *Hf.* Ch.	„ (subalp.).	
380. Brachycome radicans, *Steetz* Ch.	„	
381. Brachycome linearifolia, *DC.* Ch.	„	
382. Brachycome scapiformis, *DC.* Ch.	„	
383. Brachycome *parvula, *Hf.*	Tasmania.	
384. Brachycome *pumila, *Walp.*	„	
385. Brachycome angustifolia, *A. Cunn.*	Australia.	
386. Brachycome stricta, *DC.* Ch.	„	
387. Brachycome oblongifolia, *Benth.*	Tasmania.	
388. Brachycome diversifolia, *Fisch.* Ch	Australia.	
389. Brachycome ciliaris, *Less.*	„	

	Distribution of Species.	Distr. of Genera or representatives.
390. Paquerina graminea, *Cass.* Ch.	Australia	Australia.
391. Lagenophora Billardieri, *Cass.* Ch.	„ India, Japan	Aust., N.Z., Ind., Ant., Am.
392. Lagenophora latifolia, *H.f.* Ch.	Tasmania (subalp.).	
393. Lagenophora *montana, *H.f.* Ch.	„ „	
394. Lagenophora Gunniana, *Steetz* Ch.	Australia.	
395. Lagenophora Emphysopus, *H.f.*	„	
396. Nablonium calyceroides, *Cass.*	„	Australia.
397. Cotula coronopifolia, *Linn.*	„ N. Zeal., Afr., Eur.	Europe, etc.
398. Cotula australis, *H.f.*	„ „	S. Africa.
399. Cotula integrifolia, *H.f.*	Tasmania.	
400. Cotula alpina, *H.f.* Ch.	Australia (subalp.).	
401. Leptinella longipes, *H.f.* Ch.	„	S. Amer., Austr., Antarctic.
402. Leptinella intricata, *H.f.* Ch.	„	
403. Leptinella Filicula, *H.f.* Ch.	„ (subalp.).	
404. Myriogyne minuta, *Less.* Ch.	„ N. Zeal., Asia, Afr.	Tropics.
405. Scleroleima Forsteroides, *H.f.* Ch.	Tasmania (alpine)	Tasmania.
406. Trineuron scapigerum, *Muell.*	„ „	N. Zealand, Austr., Ant.
407. Calocephalus lacteus, *Br.*	„	Australia.
408. Leucophyta Brownei, *Less.*	„	„
409. Craspedia Richea, *Cass.* Ch.	„ New Zealand	Australia, New Zealand.
410. Craspedia *macrocephala, *Hook.* Ch.	„	
411. Craspedia *alpina, *Back.* Ch.	„ (alpine).	
412. Skirrhophorus eriocephalus, *H.f.* Ch.	„	Australia.
413. Actinopappus perpusillus, *H.f.*	„	„
414. Pumilo Preissii, *Sond.*	„	„
415. Apalochlamys Billardieri, *DC.*	„	„
416. Cassinia aculeata, *Br.* Ch.	„	Austr., N. Zeal., N. Caled.
417. Ozothamnus Hookeri, *Sonder.* Ch.	„ (subalp.)	Australia, New Zealand.
418. Ozothamnus lycopodioides, *H.f.*	Tasmania.	
419. Ozothamnus selaginoides, *Sonder*	„ (subalp.).	
420. Ozothamnus scutellifolius, *H.f.*	„	
421. Ozothamnus obcordatus, *DC.* Ch.	Australia.	
422. Ozothamnus reticulatus, *DC.*	„	
423. Ozothamnus cinereus, *Br.*	„	
424. Ozothamnus bracteolatus, *H.f.*	Tasmania.	
425. Ozothamnus Antennaria, *H.f.* Ch.	„ (subalp.).	
426. Ozothamnus Backhousii, *H.f.*	„ „	
427. Ozothamnus ledifolius, *H.f.*	„ „	
428. Ozothamnus ericæfolius, *H.f.*	„ „	
429. Ozothamnus rosmarinifolius, *Br.* Ch.	Australia.	
430. Ozothamnus Gunnii, *H.f.*	Tasmania.	
431. Ozothamnus thyrsoideus, *DC.* Ch.	„	
432. Ozothamnus ferrugineus, *Br.* Ch.	Australia.	
433. Raoulia catipes, *H.f.* Ch.	„ (alpine)	New Zealand.
434. Pterygopappus Lawrencei, *H.f.* Ch.	Tasmania (alpine)	Tasmania.
435. Leptorhynchus squamatus, *Juss.* Ch.	Australia	Australia.

	Distribution of Species.	Distr. of Genera or representatives.
436. Leptorhynchus elongatus, *DC.* Ch.	Australia.	
437. Podolepis acuminata, *Br.* Ch.	„	Australia.
438. Millotia tenuifolia, *Cass.*	„	Australia.
439. Helichrysum bracteatum, *Willd.* Ch.	„	Aust., N. Zeal., S. Afr., Eur.
440. Helichrysum scorpioides, *Lab.* Ch.	„	
441. Helichrysum semipapposum, *DC.* Ch.	„	
442. Helichrysum apiculatum, *DC.* Ch.	„	
443. Helichrysum papillosum, *Lab.*	„	
444. Helichrysum leucopsideum, *DC.*	„	
445. Helichrysum dealbatum, *Lab.* Ch.	„	
446. Helichrysum pumilum, *H.f.*	Tasmania (subalp.).	
447. Helichrysum Milligani, *H.f.*	„	„
448. Helipterum incanum, *DC.*	Australia	Australia, South Africa.
449. Helipterum anthemoides, *DC.* Ch.	„	
450. Gnaphalium luteo-album, *L.*	„ (ubiquitous).	Europe, etc.
451. Gnaphalium involucratum, *Forst.* Ch.	„ New Zealand.	
452. Gnaphalium collinum, *Lab.* Ch.	„	
453. Gnaphalium *alpigenum, *Muell.* Ch.	„ (alpine).	
454. Gnaphalium indutum, *H.f.*	„	
455. Gnaphalium? Planchoni, *H.f.* Ch.	Tasmania (alpine).	
456. Erechtites prenanthoides, *DC.*	Australia, New Zealand	Australia, New Zealand.
457. Erechtites arguta, *DC.*	„	„
458. Erechtites quadridenta, *DC.* Ch.	„	„
459. Erechtites hispidula, *DC.* Ch.	„	„
460. Erechtites Gunnii, *H.f.* Ch.	Tasmania (subalp.).	
461. Senecio lautus, *Forst.* Ch.	Australia, New Zealand	Europe, etc.
462. Senecio capillifolius, *H.f.*	Tasmania.	
463. Senecio pectinatus, *DC.* Ch.	„ (subalp.).	
464. Senecio leptocarpus, *DC.* Ch.	„	„
465. Senecio spathulatus, *A. Rich.*	Australia.	
466. Senecio velleioides, *A. C.* Ch.	„	
467. Senecio australis, *Willd.* Ch.	„	
468. Senecio odoratus, *Horn.*	„	
469. Senecio Georgianus, *DC.*	„	
470. Senecio primulifolius, *Muell.*	Tasmania (alpine).	
471. Senecio papillosus, *Muell.*	„ (alpine).	
472. Bedfordia salicina, *DC.* Ch.	Australia	Australia.
473. Bedfordia linearis, *DC.*	Tasmania (subalp.).	
474. Centropappus Brunonis, *H.f.*	„	„ Australia.
475. Cymbonotus Lawsonianus, *Cass.*	Australia	Cape Affinity.
476. Microseris Forsteri, *H.f.* Ch.	„ New Zealand	South America.
477. Picris hieracioides, *L.*	„	„ Eur. Europe.
478. Sonchus asper, *Fuchs.* Ch.	„ (ubiquitous)	Europe.

XLIII. *Brunoniaceæ.*

479. Brunonia australis, *Linn.*	Australia	Australia.

XLIV. *Goodeniaceæ.*

	Distribution of Species.	Distr. of Genera or representatives.
480. Dampiera stricta, *Br.*	Australia	Australia.
481. Scævola Hookeri, *Muell.* Ch.	„ (subalp.).	India, etc.
482. Selliera radicans, *Cav.*	„ N. Zeal., Antarc.	
483. Goodenia ovata, *Sm.* Ch.	„	Australia.
484. Goodenia geniculata, *Br.*	„	
485. Goodenia hederacea, *Sm.* Ch.	„	
486. Goodenia elongata, *Lab.* Ch.	„	
487. Goodenia humilis, *Br.*	„	
488. Velleia paradoxa, *Br.* Ch.	„	Australia.
489. Velleia montana, *H.f.* Ch.	„ (subalp.).	

XLV. *Stylideæ.*

490. Stylidium graminifolium, *Sw.* Ch.	Australia	Australia, India.
491. Stylidium despectum, *Br.*	„	
492. Stylidium perpusillum, *H.f.*	Tasmania.	
493. Forstera bellidifolia, *Hook.*	„ (alpine)	Australia, New Zealand.

XLVI. *Lobeliaceæ.*

494. Lobelia anceps, *Th.*	Aust., N. Zl., S. Af., S. Am.	Europe, etc.
495. Lobelia surrepens, *H.f.* Ch.	Tasmania (subalp.).	
496. Lobelia pedunculata, *Br.* Ch.	Australia.	
497. Lobelia fluviatilis, *Br.* Ch.	„	
498. Lobelia irrigua, *Br.*	„	
499. Lobelia gibbosa, *Lab.* Ch.	„	

XLVII. *Campanulaceæ.*

500. Wahlenbergia gracilis, *A. DC.* Ch.	Australia, N. Zeal., India	South Africa.
501. Wahlenbergia *saxicola, *A. DC.* Ch.	New Zealand (alpine).	

XLVIII. *Ericeæ.*

502. Gaultheria hispida, *Br.* Ch.	Australia (subalp.)	India, America.
503. Gaultheria *lanceolata, *H.f.*	Tasmania (alpine).	
504. Gaultheria antipoda, var. γ, *H.f.* Ch.	New Zealand (alpine).	
505. Pernettya Tasmanica, *H.f.* Ch.	Tasmania (alpine)	Antarctic, S. America.

XLIX. *Epacrideæ.*

506. Styphelia adscendens, *Br.*	Australia	Australia.
507. Astroloma humifusum, *Br.* Ch.	„	Australia.
508. Stenanthera pinifolia, *Br.*	„	Australia.
509. Cyathodes glauca, *Lab.*	Tasmania	Aust., N. Zeal., Poly.
510. Cyathodes straminea, *Br.*	„ (alpine).	
511. Cyathodes *macrantha, *H.f.* Ch.	„ „	
512. Cyathodes dealbata, *Br.* Ch.	„ „	

	Distribution of Species.	Distr. of Genera or representatives.
513. Cyathodes adscendens, *H.f.* Ch. . . .	Tasmania (alpine).	
514. Cyathodes divaricata, *H.f.*	Australia.	
515. Cyathodes parvifolia, *Br.* Ch. . . .	Tasmania.	
516. Cyathodes Oxycedrus, *Br.* Ch. . . .	„	New Zealand.
517. Cyathodes abietina, *Br.*	„	
518. Lissanthe strigosa, *Br.* Ch.	Australia	. . . . . Australia.
519. Lissanthe montana, *Br.*	„	(subalp.).
520. Lissanthe daphnoides, *Br.*	„	
521. Lissanthe ciliata, *Br.* Ch.	„	
522. Leucopogon Richei, *Br.*	„	. . . . . Aust., N. Zeal., Malay Isls.
523. Leucopogon affinis, *Br.*	„	
524. Leucopogon australis, *Br.*	„	
525. Leucopogon virgatus, *Br.* Ch. . . .	„	
526. Leucopogon ericoides, *Br.* Ch. . . .	„	
527. Leucopogon collinus, *Br.* Ch. . . .	„	
528. Leucopogon *ciliatus, *A. C.* Ch. . . .	„	
529. Leucopogon Hookeri, *Sond.* Ch. . .	„	(alpine).
530. Leucopogon Frazeri, *A. C.* Ch. . . .	„	New Zealand.
531. Monotoca lineata, *Br.* Ch.	„	. . . . . Australia.
532. Monotoca empetrifolia, *Br.* Ch. . . .	Tasmania (alpine).	
533. Acrotriche serrulata, *Br.* Ch.	Australia	. . . . . Australia.
534. Acrotriche *patula, *Br.*	„	
535. Decaspora disticha, *Br.*	Tasmania	. . . . . Australia.
536. Decaspora Cunninghamii, *DC.* Ch. . .	„	
537. Decaspora Gunnii, *H.f.*	„	
538. Decaspora thymifolia, *Br.* Ch. . . .	„	(alpine).
539. Pentachondra involucrata, *Br.* Ch. . .	„	„ . . . Australia, New Zealand.
540. Pentachondra ericæfolia, *H.f.*	„	„
541. Pentachondra pumila, *Br.* Ch. . . .	Australia (alpine), N. Zeal.	
542. Pentachondra verticillata, *H.f.* . . .	Tasmania	„
543. Epacris *Gunnii, *H.f.* Ch.	Australia (subalp.)	. . . Australia, New Zealand.
544. Epacris impressa, *Lab.* Ch.	„	
545. Epacris *ceræflora, *Grah.*	„	
546. Epacris *ruscifolia, *Br.*	„	
547. Epacris lanuginosa, *Lab.* Ch.	„	
548. Epacris mucronulata, *Br.*	Tasmania.	
549. Epacris heteronema, *Lab.*	Australia (subalp.).	
550. Epacris squarrosa, *H.f.*	Tasmania.	
551. Epacris myrtifolia, *Lab.*	„	
552. Epacris *serpyllifolia, *Br.* Ch. . . .	Australia (alpine).	
553. Epacris *exserta, *Br.* Ch.	Tasmania.	
554. Epacris *virgata, *H.f.*	„	
555. Epacris obtusifolia, *Sm.*	Australia.	
556. Epacris *Franklinii, *H.f.*	Tasmania.	
557. Epacris *corymbiflora, *H.f.*	„	
558. Epacris petrophila, *H.f.*	Australia (alpine).	

	Distribution of Species.	Distr. of Genera or representatives.
559. Prionotes cerinthoides, *Br.*	Tasmania (subalp.)	Tasmania, South America.
560. Archeria hirtella, *H.f.*	„	Tasmania.
561. Archeria eriocarpa, *H.f.* Ch.	„	
562. Archeria serpyllifolia, *H.f.*	„ (alpine).	
563. Archeria *minor, *H.f.*	„ „	
564. Sprengelia incarnata, *Sm.* Ch.	Australia	Australia.
565. Sprengelia *propinqua, *A. C.* Ch.	Tasmania (subalp.).	
566. Sprengelia *montana, *Br.* Ch.	„ (alpine).	
567. Cystanthe Sprengelioides, *Br.* Ch.	„ „	Tasmania.
568. Cystanthe procera, *Muell.*	„	
569. Pilitis acerosa, *Lind.* Ch.	„ (alpine)	Tasmania.
570. Pilitis Milligani, *H.f.*	„ „	
571. Richea pandanifolia, *H.f.*	„ (subalp.)	Australia.
572. Richea dracophylla, *Br.*	„ „	
573. Richea Gunnii, *H.f.* Ch.	Australia (alpine).	
574. Richea *scoparia, *H.f.* Ch.	Tasmania „	
575. Dracophyllum Milligani, *H.f.*	„ „	Aust., N. Zeal., N. Caled.
576. Dracophyllum minimum, *Muell.*	„ „	

L. *Oleaceæ.*

577. Notelæa ligustrina, *Vent.* Ch.	Australia	Australia.

LI. *Apocryneæ.*

578. Alyxia buxifolia, *Br.*	Australia	India.
579. Lyonsia straminea, *Br.* Ch.	Australia	New Caledonia.

LII. *Gentianeæ.*

580. Sebæa ovata, *Br.* Ch.	Australia, New Zealand	South Africa.
581. Sebæa albidiflora, *Muell.*	„	
582. Erythræa australis, *Br.*	Australia	Europe, etc.
583. Gentiana montana, *Forst.* Ch.	„ New Zealand	Europe, etc.
584. Gentiana Diemensis, *Griseb.* Ch.	„ (subalp.).	
585. Villarsia parnassiifolia, *Br.* Ch.	„	Europe, etc.
586. Villarsia exigua, *Muell.*	„ ?	
587. Liparophyllum Gunnii, *H.f.*	Tasmania (alp.), I. of Pines	Europe, etc.

LXIII. *Loganiaceæ.*

588. Mitrasacme paradoxa, *Br.* Ch.	Australia	India.
589. Mitrasacme distylis, *Hook.*	„	
590. Mitrasacme serpyllifolia, *Br.* Ch.	„	
591. Mitrasacme pilosa, *Lab.* Ch.	„	
592. Mitrasacme montana, *H.f.*	Tasmania (alpine).	
593. Mitrasacme Archeri, *H.f.* Ch.	„ „	

LIV. *Convolvulaceæ.*

594. Convolvulus erubescens, *Sims*	Australia, N. Zeal., Europe	Europe, etc.

	Distribution of Species.	Distr. of Genera or representatives.
595. Calystegia Sepium, *Br.*	Aust., N. Z., Ant., Eur., Ind.	Europe, etc.
596. Calystegia Soldanella, *Br.*	„ „	Eur., N. & S. Am.
597. Wilsonia humilis, *Br.*	Australia	Australia.
598. Wilsonia Backhousiana, *H.f.* Ch.	„	
599. Dichondra repens, *Forst.* Ch.	Aust., N. Z., India, S. Af., N & S. Am.	
600. Cuscuta australis, *Br.*	Australia, New Zealand	Europe, etc.

LV. *Borragineæ.*

601. Myosotis australis, *Br.* Ch.	Australia, New Zealand?	Europe, etc.
602. Myosotis suaveolens, *Br.* Ch.	„	
603. Cynoglossum australe, *Br.* Ch.	„	Europe, etc.
604. Cynoglossum suaveolens, *Br.* Ch.	„	
605. Cynoglossum latifolium, *Br.*	„	

LXVI. *Labiatæ.*

606. Mentha australis, *Br.*	Australia	Europe, etc.
607. Mentha gracilis, *Br.* Ch.	Tasmania.	
608. Mentha *serpyllifolia, *Benth.*	„	
609. Lycopus australis, *Br.* Ch.	Australia	Europe, etc.
610. Prunella vulgaris, *Linn.* Ch.	„	Europe, etc.
611. Scutellaria humilis, *Br.* Ch.	„	Europe, etc.
612. Prostanthera lasianthos, *Br.* Ch.	„	Australia.
613. Prostanthera rotundifolia, *Br.*	„	
614. Prostanthera retusa, *Br.*	„	
615. Westringia rubiæfolia, *Br.*	Tasmania	Australia.
616. Westringia brevifolia, *Benth.* Ch.	„	
617. Westringia angustifolia, *Br.*	Australia.	
618. Teucrium corymbosum, *Br.* Ch.	„	Europe, etc.
619. Ajuga australis, *Br.*	„	Europe, etc.

LVII. *Myoporineæ.*

620. Myoporum Tasmanicum, *DC.*	Australia	Australia, Pacific.

LVIII. *Solaneæ.*

621. Solanum nigrum, *Linn.*	Australia (ubiquitous).	
622. Solanum aviculare, *Forst.* Ch.	„	New Zealand?

LIX. *Scrophularineæ.*

623. Anthocercis Tasmanica, *H.f.*	Tasmania	Australia.
624. Mimulus repens, *Br.*	Australia, New Zealand	America, India.
625. Mazus Pumilio, *Br.* Ch.	„ „	India.
626. Gratiola pubescens, *Br.* Ch.	„ „	America, Asia.
627. Gratiola latifolia, *Br.* Ch.	„	
628. Gratiola *nana, *Benth.* Ch.	Tasmania (alpine).	
629. Glossostigma elatinoides, *Benth.*	Australia, New Zealand	Asia, South Africa.

	Distribution of Species.	Distr. of Genera or representatives.
630. Limosella aquatica, *Linn.*	Aust., N. Zeal., Ant. (ubiq.)	Europe, etc.
631. Veronica formosa, *Br.*	Tasmania	Europe, etc.
632. Veronica labiata, *Br.* Ch.	Australia.	
633. Veronica nivea, *Lindl.* Ch.	„ (subalp.).	
634. Veronica calycina, *Br.* Ch.	„	
635. Veronica distans, *Br.*	„	
636. Veronica arguta, *Br.*	„ (subalp.).	
637. Veronica gracilis, *Br.* Ch.	„	
638. Ourisia integrifolia, *Br.* Ch.	Tasmania (alpine)	New Zealand, Antarctic.
639. Euphrasia *alpina, *Br.* Ch.	Australia (alpine)	Europe, etc.
640. Euphrasia *collina, *Br.* Ch.	„	
641. Euphrasia multicaulis, *Benth.* Ch.	„	
642. Euphrasia scabra, *Br.* Ch.	„	
643. Euphrasia striata, *Br.* Ch.	Tasmania (alpine).	
644. Euphrasia cuspidata, *H.f.* Ch.	„ „	

LX. *Lentibularineæ.*

645. Utricularia australis, *Br.* Ch.	Australia	Europe, etc.
646. Utricularia dichotoma, *Lab.* Ch.	„	
647. Utricularia *uniflora, *Br.*	„	
648. Utricularia lateriflora, *Br.*	„	
649. Utricularia monanthos, *H.f.*	Tasmania (alpine).	
650. Polypompholyx tenella, *Lab.*	Australia	Australia.

LXI. *Primulaceæ.*

651. Samolus litoralis, *Br.*	Australia, N. Zeal., S. Amer.	Europe, etc.

LXII. *Plumbagineæ.*

652. Statice australis, *Spr.*	Australia.	Europe, etc.

LXIII. *Plantagineæ.*

653. Plantago varia, *Br.* Ch.	Australia	Europe, etc.
654. Plantago bellidioides, *Dcne.* Ch.	Tasmania (subalp.).	
655. Plantago antarctica, *Dcne.* Ch.	„ „	
656. Plantago Archeri, *H.f.* Ch.	„ (alpine).	
657. Plantago Tasmanica, *H.f.* Ch.	„ „	
658. Plantago Brownii, *Rich.*	Australia, N. Zeal., Antarct.	
659. Plantago paradoxa, *Nob.* Ch.	Tasmania (alpine).	
660. Plantago Gunnii, *Nob.* Ch.	„ „	

LXIV. *Polygoneæ.*

661. Rumex Brownii, *Campd.*	Australia	Europe, etc.
662. Rumex bidens, *Br.*	„	
663. Polygonum minus, *Huds.*	„ N. Zeal., Europe.	Europe, etc.
664. Polygonum subsessile, *Br.*	„	
665. Polygonum strigosum, *Br.*	„	

	Distribution of Species.	Distr. of Genera or representatives.
666. Polygonum prostratum, *Br.* Ch. . .	Australia.	
667. Muehlenbeckia adpressa, *Meisn.* Ch. .	„	N. Zeal. . . . Aust., Pacific, S. America.
668. Muehlenbeckia axillaris, *H.f.*	„	„ (subalp.).

LXV. *Phytolaccæ.*

669. Didymotheca thesioides, *H.f.*	Australia	Australia.

LXVI. *Amarantaceæ.*

670. Trichinium spathulatum, *Br.*	Australia	Australia.
671. Alternanthera sessilis, *Br.*	„ N. Zeal. (ubiq.)	. Tropics.
672. Hemichroa pentandra, *Br.*	„	Australia.

LXVII. *Chenopodiaceæ.*

673. Rhagodia baccata, *Moq.*	Australia	Australia.
674. Rhagodia nutans, *Br.*	„	
675. Chenopodium glaucum, *Linn.*	„ N.Zeal., Ant., Europe	Europe, etc.
676. Chenopodium erosum, *Br.*	„	
677. Atriplex cinerea, *Poir.*	„ N. Zealand . . .	Europe, etc.
678. Atriplex patula, *Linn.*	„ „	Europe.
679. Atriplex Billardieri, *H.f.*	„ „	
680. Threlkeldia diffusa, *Br.*	„	Australia.
681. Suæda maritima, *Dun.*	„ N. Zealand (ubiq.)	. Europe, etc.
682. Salicornia Arbuscula, *Br.*	„ „ Tropics	. Europe, etc.
683. Salicornia Indica, *Willd.*	„ „ „	

LXVIII. *Laurineæ.*

684. Cassytha melantha, *Br.* Ch.	Australia	Tropics.
685. Cassytha pubescens, *Br.* Ch. . . .	„	
686. Cassytha glabella, *Br.*	„	

LXIX. *Proteaceæ.*

687. Conospermum taxifolium, *Sm.* . . .	Australia	Australia.
688. Isopogon ceratophyllus, *Br.*	„	Australia.
689. Agastachys odorata, *Br.*	Tasmania	Tasmania.
690. Cenarrhenes nitida, *Lab.*	„	Tasmania.
691. Persoonia juniperina, *Lab.* Ch. . . .	Australia	Australia, New Zealand.
692. Persoonia Gunnii, *H.f.* Ch.	Tasmania (subalp.).	
693. Bellendena montana, *Br.* Ch. . . .	„ (alpine) . . .	Tasmania.
694. Grevillea australis, *Br.* Ch.	Australia	Australia, New Caledonia.
695. Hakea Epiglottis, *Lab.*	Australia	Australia.
696. Hakea pugioniformis, *Cav.*	„	
697. Hakea microcarpa, *Br.* Ch.	„	
698. Hakea acicularis, *Br.*	„	
699. Hakea lissosperma, *Br.* Ch.	Tasmania (subalp.).	
700. Orites diversifolia, *Br.*	„ (alpine) . . .	Tasmania, (Australia.)

	Distribution of Species.	Distr. of Genera or representatives.
701. Orites Milligani, *Meisn.*	Tasmania (alpine).	
702. Orites revoluta, *Br.* Ch.	„ „	
703. Orites acicularis, *Br.* Ch.	„ „	
704. Telopea truncata, *Br.* Ch.	„ (subalp.)	Australia.
705. Lomatia polymorpha, *Br.*	„ „	Australia, South America.
706. Lomatia tinctoria, *Br.* Ch.	„	
707. Banksia media, *Br.*	„	Australia.
708. Banksia australis, *Br.* Ch.	„	

LXX. *Thymeleæ.*

709. Drapetes Tasmanica, *H.f.* Ch.	Australia (alpine)	N. Zeal., Fuegia, Borneo.
710. Pimelea filiformis, *H.f.*	Tasmania	Australia, New Zealand.
711. Pimelea gracilis, *Br.* Ch.	Australia.	
712. Pimelea drupacea, *Lab.* Ch.	„	
713. Pimelea Gunnii, *H.f.* Ch.	Tasmania (subalp.).	
714. Pimelea nivea, *Lab.* Ch.	„ „	
715. Pimelea sericea, *Br.* Ch.	„ „	
716. Pimelea cinerea, *Br.*	„	
717. Pimelea ligustrina, *Lab.* Ch.	Australia.	
718. Pimelea flava, *Br.* Ch.	„	
719. Pimelea cernua, *Br.* Ch.	„	
720. Pimelea *linifolia, *Sm.*	„	
721. Pimelea glauca, *Br.*	„	
722. Pimelea humilis, *Br.*	„	
723. Pimelea pauciflora, *Br.* Ch.	„	
724. Pimelea pygmæa, *Muell.* Ch.	Tasmania (alpine).	

LXXI. *Santalaceæ.*

725. Exocarpus cupressiformis, *Lab.*	Australia	Australia.
726. Exocarpus stricta, *Br.* Ch.	„	
727. Exocarpus humifusa, *Br.* Ch.	Aust. (alp.), N. Zl., Sandw. Isls.?	
728. Leptomeria Billardieri, *Br.* Ch.	Australia	Australia.
729. Leptomeria glomerata, *Muell.*	Tasmania.	
730. Thesium australe, *Br.* Ch.	Australia	Europe, etc.

LXXII. *Euphorbiaceæ.*

731. Ricinocarpus pinifolius, *Desf.*	Australia	Australia.
732. Beyeria oblongifolia, *H.f.* Ch.	„	Australia.
733. Beyeria *Backhousii, *H.f.*	„	
734. Bertya rosmarinifolia, *Pl.*	„	Australia.
735. Amperea spartioides, *Brong.* Ch.	„	Australia.
736. Phyllanthus Gunnii, *H.f.* Ch.	„	India, etc.
737. Phyllanthus australis, *H.f.* Ch.	„	
738. Micranthea hexandra, *H.f.* Ch.	„	Australia.
739. Poranthera microphylla, *Brongn.* Ch.	„	Australia.

LXXIII. *Urticeæ.*

	Distribution of Species.	Distr. of Genera or representatives.
740. Urtica incisa, *Poir.* Ch.	New Zealand	Europe, etc.
741. Parietaria debilis, *Forst.* Ch.	ubiquitous	Europe, etc.
742. Australina pusilla, *Gaud.* Ch.	Australia, New Zealand	Australia, New Zealand.

LXXIV. *Cupuliferæ.*

743. Fagus Cunninghamii, *Hook.* Ch.	Australia	Eur., N. Zl., S. Am., Antar.
744. Fagus Gunnii, *H.f.*	Tasmania (alpine).	

LXXV. *Casuarineæ.*

745. Casuarina quadrivalvis, *Lab.*	Australia	Australia, India, etc.
746. Casuarina distyla, *Vent.*	„	
747. Casuarina *suberosa, *Ott. & Diet.* Ch.	„	

LXXVI. *Coniferæ.*

748. Frenela rhomboidea, *Endl.*	Australia		Australia.
749. Frenela *australis, *Endl.*	Tasmania.		
750. Diselma Archeri, *H.f.* Ch.	„	(subalp.)	Tasmania.
751. Athrotaxis cupressioides, *Don.* Ch.	„	„	Tasmania.
752. Athrotaxis selaginoides, *Don.* Ch.	„	„	
753. Athrotaxis laxifolia, *Hook.* Ch.	„	„	
754. Pherosphæra Hookeriana, *Arch.*	„	(alpine)	Tasmania.
755. Podocarpus alpina, *Br.* Ch.	Australia	(subalp.)	India, etc.
756. Dacrydium Franklinii, *H.f.*	Tasmania		N. Zealand, etc.
757. Microcachrys tetragona, *H.f.* Ch.	„	(alpine)	Tasmania.
758. Phyllocladus rhomboidalis, *Rich.* Ch.	„	(subalp.)	New Zealand, Borneo.

MONOCOTYLEDONES.

I. *Orchideæ.*

1. Thelymitra antennifera, *H.f.*	Australia		Aus., N. Zl., Java, Antarc.
2. Thelymitra Smithiana, *H.f.*	„		
3. Thelymitra venosa, *Br.* Ch.	„		
4. Thelymitra carnea, *Br.* Ch.	„		
5. Thelymitra nuda, *Br.* Ch.	„	(New Zealand?)	
6. Thelymitra angustifolia, *Br.* Ch.	„		
7. Thelymitra ixioides, *Br.* Ch.	„		
8. Diuris maculata, *Sm.* Ch.	„		Australia.
9. Diuris palustris, *Lindl.*	„		
10. Diuris sulphurea, *Br.* Ch.	„		
11. Diuris corymbosa, *Lindl.*	„		
12. Diuris pedunculata, *Br.* Ch.	„		
13. Cryptostylis longifolia, *Br.* Ch.	„		Australia.
14. Prasophyllum australe, *Br.*	„		Australia.

	Distribution of Species.	Distr. of Genera or representatives.
15. Prasophyllum lutescens, *Lindl.* Ch.	Australia.	
16. Prasophyllum brevilabre, *H.f.* Ch.	,,	
17. Prasophyllum *flavum, *Br.* Ch.	,,	
18. Prasophyllum patens, *Br.* Ch.	,,	
19. Prasophyllum *truncatum, *Lindl.* Ch.	,,	
20. Prasophyllum alpinum, *Br.* Ch.	,, (subalp.).	
21. Prasophyllum *fuscum, *Br.* Ch.	,,	
22. Prasophyllum brachystachyum, *Lindl.*	,,	
23. Prasophyllum nudiscapum, *H.f.*	Tasmania.	
24. Prasophyllum despectans, *H.f.* Ch.	,,	
25. Prasophyllum Archeri, *H.f.* Ch.	,,	
26. Prasophyllum nudum, *H.f.* Ch.	,, New Zealand.	
27. Calochilus campestris, *Br.*	Australia	Australia.
28. Spiranthes australis, *Lindl.* Ch.	Aus., N.Z., China, Ind., Siber.	Europe, etc.
29. Corysanthes fimbriata, *Br.* Ch.	,,	Australia, Java.
30. Lyperanthus nigricans, *Br.*	,,	Australia, New Zealand.
31. Burnettia cuneata, *Lindl.*	Tasmania	Tasmania.
32. Caleana major, *Br.* Ch.	Australia	Australia.
33. Caleana minor, *Br.*	,,	
34. Pterostylis curta, *Br.*	,,	Australia, New Zealand.
35. Pterostylis nutans, *Br.* Ch.	,,	
36. Pterostylis pedunculata, *Br.* Ch.	Tasmania.	
37. Pterostylis nana, *Br.* Ch.	Australia.	
38. Pterostylis obtusa, *Br.* Ch.	Tasmania.	
39. Pterostylis cucullata, *Br.* Ch.	,,	
40. Pterostylis *dubia, *Br.* Ch.	,,	
41. Pterostylis furcata, *Lindl.* Ch.	,,	
42. Pterostylis squamata, *Br.*	Australia, New Zealand.	
43. Pterostylis mutica, *Br.*	,,	
44. Pterostylis rufa, *Br.*	,,	
45. Pterostylis præcox, *Lindl.*	,,	
46. Pterostylis aphylla, *Lindl.* Ch.	,,	
47. Pterostylis parviflora, *Br.* Ch.	,,	
48. Pterostylis longifolia, *Br.* Ch.	,,	
49. Chiloglottis diphylla, *Br.* Ch.	,,	New Zealand, Antarctic.
50. Chiloglottis Gunnii, *Lindl.* Ch.	,,	
51. Microtis pulchella, *Br.*	,,	Aust., N. Zeal., Java.
52. Microtis *arenaria, *Br.*	,,	
53. Microtis rara, *Br.* Ch.	Aust., N. Zl., Java, N. Caled., Bonin.	
54. Microtis *parviflora, *Br.* Ch.	Australia.	
55. Acianthus caudatus, *Br.* Ch.	,,	Aust., N. Zl., Antarct.
56. Acianthus exsertus, *Br.* Ch.	,,	
57. Acianthus viridis, *H.f.*	Tasmania.	
58. Cyrtostylis reniformis, *Br.* Ch.	Australia	Australia, New Zealand.
59. Eriochilus autumnalis, *Br.* Ch.	,,	Australia.
60. Caladenia Menziesii, *Br.*	,,	Australia, New Zealand.

	Distribution of Species.	Distr. of Genera or representatives.
61. Caladenia filamentosa, *Br.* Ch. . . .	Australia.	
62. Caladenia dilatata, *Br.* Ch.	,,	
63. Caladenia clavigera, *A. C.* Ch.	,,	
64. Caladenia Patersoni, *Br.* Ch.	,,	
65. Caladenia *pallida, *Lindl.*	,,	
66. Caladenia latifolia, *Br.*	,,	
67. Caladenia barbata, *Lindl.*	,,	
68. Caladenia cærulea, *Br.*	,,	
69. Caladenia carnea, *Br.* Ch.	,,	
70. Caladenia congesta, *Br.* Ch.	,,	
71. Caladenia alata, *Br.* Ch.	,,	
72. Caladenia *angustata, *Lindl.* Ch. . . .	,,	
73. Glossodia major, *Br.* Ch.	,,	. . . . . Australia.
74. Gastrodia sesamoides, *Br.* Ch.	,,	. . . . . Australia, New Zealand.
75. Dipodium punctatum, *Br.* Ch.	,,	. . . . . Australia, New Caledonia.
76. Gunnia australis, *Lindl.*	,,	. . . . . Australia.
77. Dendrobium Milligani, *Muell.*	Tasmania	. . . . . India, etc.
78. Dendrobium, sp.?	,,	

II. *Irideæ.*

79. Patersonia glauca, *Br.*. Ch.	Australia	. . . . . Australia.
80. Patersonia longiscapa, *Sweet*	,,	
81. Diplarrhena Moræa, *Br.* Ch.	,,	. . . . . Australia.
82. Libertia Lawrencii, *H.f.* Ch.	,, (subalp.).	. . . Australia, N. Zeal., Chili.

III. *Hæmodoraceæ.*

83. Hæmodorum distichophyllum, *Hook.* . .	Tasmania (alpine).	. . . Australia.

IV. *Hypoxideæ.*

84. Hypoxis hygrometrica, *Lab.*	Australia	. . . . . India and S. Africa.
85. Hypoxis glabella, *Br.* Ch.	,,	
86. Hypoxis pusilla, *H.f.*	,,	

V. *Hydrocharideæ.*

87. Vallisneria spiralis, *L.*	Australia (ubiquitous).	. . . Warm latitudes.

VI. *Pistiaceæ.*

88. Lemna minor, *L.*	Australia (ubiquitous).	. . . Ubiquitous.
89. Lemna trisulca, *L.*	,,	,,

VII. *Typhaceæ.*

90. Typha angustifolia, *L.*	Australia (ubiquitous).	. . . Ubiquitous.

VIII. *Alismaceæ.*

91. Triglochin triandrum, *Muell.* Ch. . .	Aust., N.Z., S.Af., N. & S.Am.	Europe, etc.
92. Triglochin centrocarpum, *Hook.* . . .	Australia.	

	Distribution of Species.	Distr. of Genera or representatives.
93. Triglochin procerum, *Br.* Ch. . . .	Australia	
94. Potamogeton natans, *L.* Ch.	„	(ubiquitous). . . Europe, etc.
95. Potamogeton heterophyllus, *Schreb.* Ch.	„	„
96. Potamogeton gramineus, *L.* Ch. . . .	„	„
97. Ruppia maritima, *L.*	„	(ubiquitous). . . Europe, etc.
98. Zannichellia Preissii, *Lehm.*	„	. . Europe, etc.
99. Posidonia australis, *H.f.*	„	. . Oceans, warm and tropical.
100. Cymodocea antarctica, *H.f.*	„	. . Oceans, warm and tropical.
101. Zostera marina, *L.?*	„	(ubiquitous). . . Europe, etc.
102. Halophila ovalis, *Gaud.*	„	India, Africa . . Tropical seas.

IX. *Melanthaceæ.*

103. Burchardia umbellata, *Br.*	Australia	. . . . . Australia.
104. Anguillaria dioica, *Br.*	„	. . . . . Australia.
105. Anguillaria uniflora, *Br.* Ch. . . .	„	
106. Hewardia Tasmanica, *Hook.*	Tasmania (subalp.)	. . . Tasmania.
107. Campynema linearis, *Lab.*	„	„ . . . Tasmania.

X. *Smilaceæ.*

108. Drymophila cyanocarpa, *Br.* Ch. . .	Australia	. . . . . Tasmania.

XI. *Liliaceæ.*

109. Blandfordia grandiflora, *Br.* Ch. . .	Australia	. . . . . Australia.
110. Arthropodium paniculatum, *Br.* . . .	„	. . . . . Australia, New Zealand.
111. Arthropodium pendulum, *DC.* . . .	Tasmania.	
112. Arthropodium minus, *Br.*	Australia.	
113. Arthropodium laxum, *Sieb.*	„	
114. Arthropodium strictum, *Br.*	Tasmania.	
115. Bulbine bulbosa, *Haw.*	Australia	. . . . . Australia, S. Africa.
116. Bulbine semibarbata, *Haw.*	„	
117. Cæsia corymbosa, *Br.*	„	. . . . . Australia.
118. Cæsia parviflora, *Br.*	„	
119. Cæsia vittata, *Br.*	„	
120. Cæsia? alpina, *H.f.* Ch.	Tasmania.	
121. Thysanotus Patersoni, *Br.*	Australia	. . . . . Australia.
122. Herpolirion Tasmaniæ, *H.f.* Ch. . .	„ (alpine)	. . . . Australia, New Zealand.
123. Tricoryne elatior, *Br.*	„	. . . . . Australia.
124. Stypandra cæspitosa, *Br.*	„	. . . . . Australia, New Caledonia.
125. Stypandra umbellata, *Br.*	„	
126. Dianella cærulea, *Sims.* Ch.	„	. . . . . Aust., India, N. Z., S. Afr.
127. Dianella longifolia, *Br.*	„	
128. Dianella lævis, *Br.*	„	
129. Dianella revoluta, *Br.* Ch.	„	
130. Dianella Tasmanica, *H.f.* Ch. . . .	„	
131. Dianella Archeri, *H.f.* Ch.	Tasmania.	

	Distribution of Species.	Distr. of Genera or representatives.
132. Xanthorrhœa australis, *Br.*	Australia	Australia.
133. Xanthorrhœa hastilis, *Br.*	„	
134. Xanthorrhœa minor, *Br.*	„	
135. Laxmannia minor, *Br.*	„	Australia (Timor).
136. Astelia alpina, *Br.* Ch.	„ (alpine).	New Zealand, Polynesia.
137. Astelia stylosa, *Muell.*	Tasmania (alpine).	
138. Milligania longifolia, *H.f.*	„ (subalpine).	Tasmania.
139. Milligania densiflora, *H.f.*	„ (subalpine).	

XII. *Junceæ.*

140. Xerotes longifolia, *Br.* Ch.	Australia	Australia.
141. Xerotes glauca, *Br.*	„	
142. Juncus planifolius, *Br.* Ch.	Aust., N. Zl., Chili, Antarc.	All temperate latitudes.
143. Juncus cæspiticius, *Meyer.* Ch.	Australia (subalp.).	
144. Juncus falcatus, *Meyer.* Ch.	„	„
145. Juncus bufonius, *L.* Ch.	„ (ubiquitous).	
146. Juncus revolutus, *Br.*	„	
147. Juncus capillaceus, *H.f.* Ch.	„ N. Zeal. (alpine).	
148. Juncus Holoschœnus, *Br.* Ch.	„ „	Europe.
149. Juncus maritimus, *Lamk.*	„ (ubiquitous).	
150. Juncus australis, *H.f.*	„ New Zealand.	
151. Juncus *pallidus, *Br.* Ch.	„	
152. Juncus communis, *Meyer.* Ch.	„ (ubiquitous).	
153. Juncus pauciflorus, *Br.* Ch.	„	
154. Juncus *Gunnii, *H.f.*	Tasmania.	
155. Juncus vaginatus, *Br.*	Australia, New Zealand.	
156. Luzula campestris, *Sm.* Ch.	„ (ubiquitous).	Europe, etc.
157. Luzula *Oldfieldii, *H.f.*	Tasmania (alpine).	

XIII. *Xyrideæ.*

158. Xyris operculata, *Lab.* Ch.	Australia	America, India.
159. Xyris gracilis, *Br.*	„	

XIV. *Restiaceæ.*

160. Restio monocephalus, *Br.* Ch.	Australia	Australia, South Africa.
161. Restio complanatus, *Br.*	„	
162. Restio australis, *Br.*	„ (subalp.).	
163. Restio gracilis, *Br.*	„	
164. Restio tetraphyllus, *Lab.* Ch.	„	
165. Lepyrodia Tasmanica, *H.f.*	Tasmania	Australia.
166. Leptocarpus Brownii, *H.f.* Ch.	Australia	Australia, New Zealand.
167. Leptocarpus tenax, *Br.* Ch.	„	
168. Hypolæna fastigiata, *Br.* Ch.	„	Australia.
169. Calorophus elongata, *Lab.* Ch.	„ New Zealand	Australia, New Zealand.
170. Aphelia Gunnii, *H.f.*	„	Australia.
171. Aphelia Pumilio, *H.f.*	„	

	Distribution of Species.	Distr. of Genera or representatives.
172. Centrolepis aristata, *H.f.*	Australia	Australia.
173. Centrolepis tenuior, *R. & S.*	„	
174. Centrolepis fascicularis, *Lab.*	„	
175. Centrolepis pulvinata, *R. & S.*	„	
176. Alepyrum monogynum, *H.f.*	Tasmania (subalp.)	Australia, New Zealand.
177. Alepyrum muscoides, *H.f.*	Australia „	
178. Alepyrum Muelleri, *H.f.*	„	
179. Alepyrum polygynum, *Br.*	„	
180. Trithuria submersa, *H.f.*	„	Australia.

XV. *Cyperaceæ.*

181. Cyperus sanguineo-fuscus, *Nees*	Tasmania	All warm latitudes.
182. Cyperus Gunnii, *H.f.*	Australia.	
183. Schœnus fluitans, *H.f.*	Tasmania	Europe, etc.
184. Chætospora tenuissima, *H.f.*	Australia	Europe, etc.
185. Chætospora capillacea, *H.f.* Ch.	Tasmania.	
186. Chætospora nitens, *Br.*	Australia, New Zealand.	
187. Chætospora imberbis, *Br.* Ch.	„	„
188. Chætospora axillaris, *Br.* Ch.	„	„
189. Gymnoschœnus sphærocephalus, *H.f.* Ch.	„	Australia.
190. Chorizandra enodis, *Nees*	„	Australia.
191. Carpha alpina, *Br.* Ch.	„ N. Zeal. (alp.)	Aust., N. Zeal., Antarct.
192. Elæocharis sphacelata, *Br.* Ch.	„ N. Zeal., Pacific	Ubiquitous.
193. Elæocharis gracilis, *Br.* Ch.	„ „	
194. Isolepis fluitans, *Br.* Ch.	„ (ubiquitous)	Ubiquitous.
195. Isolepis *crassiuscula, *H.f.* Ch.	South Africa? (alp.).	
196. Isolepis lenticularis, *Br.*	Australia.	
197. Isolepis *alpina, *H.f.*	Tasmania (alpine).	
198. Isolepis prolifer, *Br.* Ch.	Aust., N. Zeal., S. Africa.	
199. Isolepis nodosa, *Br.* Ch.	„ „	S. Af., S. Amer.
200. Isolepis setacea, *Br.*	Australia (ubiquitous).	
201. Isolepis Saviana, *Schultes*	„	„
202. Isolepis cartilaginea, *Br.* Ch.	„	N. Zeal., S. Africa.
203. Isolepis riparia, *Br.* Ch.	„	„ „
204. Scirpus triqueter, *L.* Ch.	„	(ubiquitous) Ubiquitous.
205. Scirpus maritimus, *L.*	„	„
206. Scirpus lacustris, *L.*	„	„
207. Lepidosperma gladiata, *Lab.*	„	Australia, New Zealand.
208. Lepidosperma elatior, *Lab.* Ch.	„	
209. Lepidosperma longitudinalis, *Lab.*	„	
210. Lepidosperma Oldfieldii, *H.f.*	Tasmania.	
211. Lepidosperma concava, *Br.*	Australia, New Zealand.	
212. Lepidosperma *lateralis, *Br.*	„	
213. Lepidosperma *angustifolia, *H.f.*	Tasmania.	
214. Lepidosperma linearis, *Br.*	Australia.	
215. Lepidosperma squamata, *Lab.*	Tasmania.	

	Distribution of Species.	Distr. of Genera or representatives.
216. Lepidosperma globosa, *Lab.*	Tasmania.	
217. Lepidosperma tetragona, *Lab.*	„ New Zealand.	
218. Lepidosperma filiformis, *Lab.*	Australia (subalp.).	
219. Oreobolus Pumilio, *Br.* Ch.	„ N. Zeal. (alp.)	Aust., N. Zeal., Ant. Amer.
220. Cladium glomeratum, *Br.*	„	Australia, Europe, etc.
221. Cladium laxiflorum, *H.f.*	Tasmania.	
222. Cladium junceum, *Br.* Ch.	Australia, New Zealand.	
223. Cladium Gunnii, *H.f.*	„ ?	
224. Cladium tetraquetrum, *H.f.* Ch.	„	
225. Cladium schœnoides, *Br.* Ch.	„	
226. Cladium Filum, *Br.*	„	
227. Cladium Mariscus, *Br.*	„ (ubiquitous).	
228. Gahnia trifida, *Lab.*	„	Aust. N. Zl., Pacif., Malay Isls.
229. Gahnia psittacorum, *Lab.* Ch.	„	
230. Gahnia melanocarpa, *Br.*	„	
231. Caustis pentandra, *Br.*	„	Australia.
232. Carex Archeri, *Boott.* Ch.	Tasmania (alp.)	Europe, etc.
233. Carex inversa, *Br.* Ch.	Australia, New Zealand.	
234. Carex appressa, *Br.*	„ „	Antarct.
235. Carex chlorantha, *Br.* Ch.	„	
236. Carex Gaudichaudiana, *Kth.* Ch.	„	
237. Carex barbata, *Boott*	Tasmania.	
238. Carex Gunniana, *Boott.* Ch.	Australia.	
239. Carex littorea, *Lab.*	„ N. Zeal., Japan.	
240. Carex Cataractæ, *Br.* Ch.	Tasmania (alpine).	
241. Carex longifolia, *Br.*	Australia.	
242. Carex fascicularis, *Sol.* Ch.	„ New Zealand.	
243. Carex breviculmis, *Br.* Ch.	„ „	
244. Carex Bichenoviana, *Br.*	Tasmania.	
245. Uncinia tenella, *Br.* Ch.	Australia	Aust., N. Zl., temp. S. Am.
246. Uncinia riparia, *Br.* Ch.	Tasmania (subalp.).	
247. Uncinia nervosa, *Boott*	„	
248. Uncinia compacta, *Br.* Ch.	„ (alpine).	

XVI. *Gramineæ.*

249. Tetrarhena distichophylla, *Br.*	Tasmania	Australia.
250. Tetrarhena tenacissima, *Nees*	Australia.	
251. Tetrarhena acuminata, *Br.*	„	
252. Microlæna Gunnii, *H.f.* Ch.	Tasmania	Australia, New Zealand.
253. Microlæna stipoides, *Br.*	Australia, New Zealand.	
254. Diplax Tasmanica, *H.f.*	Tasmania	Tasmania, New Zealand.
255. Alopecurus geniculatus, *L.* Ch.	Aust., Eur., N. Am., N. Ind.	Europe.
256. Spinifex hirsutus, *Lab.*	Australia, New Zealand	Aust., N. Zeal., India.
257. Hemarthria uncinata, *Br.*	„	Europe, etc.
258. Anthistiria australis, *Br.* Ch.	„ India, Africa	India, etc.
259. Hierochloe redolens, *Br.* Ch.	Aust., N. Zl., Antarc. Amer.	Europe, etc.

		Distribution of Species.	Distr. of Genera or representatives.
260.	Hierochloe borealis, *R. & S.* Ch.	N. Zealand, Europe (alp.).	
261.	Hierochloe rariflora, *Hf.*	Australia.	
262.	Stipa semibarbata, *Br.*	„	All temperate latitudes.
263.	Stipa *pubescens, *Br.*	„	
264.	Stipa flavescens, *Lab.*	„	
265.	Stipa setacea, *Br.*	„	
266.	Dichelachne crinita, *Nees.* Ch.	„ New Zealand	Australia, New Zealand.
267.	Dichelachne *sciurea, *H.f.*	„ „	
268.	Dichelachne stipoides, *H.f.*	„ „	
269.	Agrostis parviflora, *Br.* Ch.	„ „	Europe, etc.
270.	Agrostis venusta, *Tr.* Ch.	„	
271.	Agrostis quadriseta, *Br.* Ch.	„ New Zealand.	
272.	Agrostis Billardieri, *Br.*	„ „	
273.	Agrostis æquata, *Nees*	Tasmania.	
274.	Agrostis *æmula, *Br.* Ch.	Australia, New Zealand.	
275.	Agrostis *scabra, *Br.* Ch.	„ (subalp.).	
276.	Agrostis *montana, *Br.* Ch.	„ (subalp.).	
277.	Agrostis contracta, *Muell.*	„	
278.	Polypogon Monspeliensis, *Desv.* Ch.	„ (introduced?)	Europe, etc.
279.	Echinopogon ovatus, *P. B.* Ch.	„ New Zealand	Australia, New Zealand.
280.	Pentapogon Billardieri, *Br.* Ch.	„	Australia.
281.	Phragmites communis, *Tr.* Ch.	„ Eur., N. Asia, etc.	Europe, etc.
282.	Deschampsia cæspitosa, *Beauv.* Ch.	Aust., N. Zl., Eur., S. Am.	Europe, etc.
283.	Trisetum subspicatum, *P. B.* Ch.	Arctic and Antarctic (alp.)	Europe, etc.
284.	Danthonia pilosa, *Br.*	Australia, New Zealand	Australia, Europe, S. Africa.
285.	Danthonia semi-annularis, *Br.* Ch.	„ „	
286.	Danthonia *subulata, *H.f.* Ch.	„	
287.	Danthonia *setacea, *Br.* Ch.	„	
288.	Danthonia pauciflora, *Br.* Ch.	„ (alpine).	
289.	Danthonia nervosa, *H.f.*	„	
290.	Danthonia *Archeri, *H.f.* Ch.	Tasmania.	
291.	Glyceria fluitans, *Br.* Ch.	Australia (ubiquitous)	Europe, etc.
292.	Glyceria stricta, *H.f.*	„ New Zealand.	
293.	Poa australis, *Br.* Ch.	„ „	Europe, etc.
294.	Poa tenera, *Muell.* Ch.	„	
295.	Poa *affinis, *Br.* Ch.	„ New Zealand.	
296.	Poa *saxicola, *Br.*	Tasmania (subalp.).	
297.	Kœleria cristata, *Pers.*	Aust., N. Zeal. (ubiq.)	Europe, etc.
298.	Festuca duriuscula, *L.*	„ „ „	Europe, etc.
299.	Festuca bromoides, *L.* Ch.	(introduced?) „	
300.	Festuca distichophylla, *Br.*	Australia.	
301.	Festuca Hookeriana, *Muell.* Ch.	„ (subalp.).	
302.	Festuca littoralis, *Lab.*	„ N. Zeal., Antarct.	
303.	Triticum scabrum, *Br.*	„ „	
304.	Triticum pectinatum, *Br.* Ch.	„	
305.	Triticum *velutinum, *Nees*	„ (subalp.).	

This catalogue places in a very strong light the thoroughly Eastern Australian character of the Tasmania Flora: out of 1,063* species, only 280, or rather more than one-fourth, have not been found on the Australian continent. There are only 22 genera and 267 species noted as being absolutely peculiar to Tasmania, of which latter fully 44 will prove, in all probability, to be varieties.

The contrast between the Floras of south-west Australia and Tasmania, in respect of their affinity with that of south-east Australia, is very remarkable, for though their geographical contiguity would lead us to expect that the Tasmanian Flora should be less different from the Victorian than that of King George's Sound is, it must be recollected that Tasmania is placed several degrees further south, in a colder climate and moister atmosphere, and is separated from Victoria by a wide and deep oceanic channel.

It will probably be conceded that Tasmania once formed a continuous southward extension of Victoria, and that as Britain was peopled with continental plants before the formation of the Channel, so Tasmania and Victoria possessed their present Flora before they were separated by Bass' Straits; but if the effects of segregation and natural selection have done so little towards modifying the Floras of the opposite shores during the immense epoch that has intervened since the earliest formation of Bass' Straits, we are all the more puzzled to account for the complete change of the south-western Flora, which is isolated by no such barrier from the south-eastern.

There are only 592 flowering plants peculiar to Tasmania and Australia, or 860 if those peculiar to Tasmania are included, so that fully one-fifth of the Flora is extra-Australian; whereas only one-sixth of the south-eastern Flora and one-tenth of the south-western are extra-Australian. Considering the before-mentioned isolation of Tasmania, this is certainly a most remarkable fact, and requires a close scrutiny,

Turning to the genera again, I find that out of the whole (394), only 22 are absolutely peculiar to Tasmania; or, adding these to the 122 which are exclusively Australian and Tasmanian, I find only 144 in all. In other words, considerably more than two-thirds of the Tasmanian genera are found in other countries besides Australia; whereas in south-western Australia much less than half the genera are extra-Australian, in south-eastern somewhat more than half, and in the whole Australian Flora, between one-half and two-thirds.

In examining the distribution of the genera and species a little further, I find that the deficiency of Australian forms, and preponderance of extra-Australian, is caused partly by the paucity of new genera of Australian affinity, partly by the absence of some that are common on the north shore of Bass's Straits, but most of all by the greater proportion of New Zealand, South American, Antarctic, and even European genera and species, some of which do not occur on the Australian continent. Thus no less than 120, or nearly one-third, of the genera, and 67, or one-fifteenth, of the Tasmanian species, are European, whilst with the other quarters it stands thus:—

In all Australia,	Europ. genera, one-sixth	of the whole;	species about	one-seventieth.
In S.E. Australia	„	less than one-third	„	one-twenty-seventh.
In S.W. Australia	„	less than one-fourth	„	one-hundredth.
In Tasmania	„	one-third	„	one-fifteenth.

* These and the following numbers will not be found to accord exactly with the data on the preceding pages, because, since the earlier sheets of the latter were printed off, I have received collections and notes from Archer, Gunn, and Mueller, that slightly alter the number of the species, varieties, and their distribution. *Stackhousia pulvinaris*, Muell. (see Vol. II. Suppl.), should be added at p. lx.; "Australia" should be added to the distribution of *Eryngium vesiculosum* (p. lxv.) and to *Calocephalus lacteus* and the ten following species (p. lxvii.). "Isle of Pines" should be expunged from 587.

There is thus a very remarkable rise in the proportion of European forms in Tasmania, and this is not due to the extension of all the European plants of Australia into Tasmania, for there are in the latter island several European genera and species that have not been found on the continent; as—

Ranunculus aquatilis.	Draba nemoralis.	Montia fontana.
Anemone.	Hierochloe borealis.	Trisetum subspicatum.
Thlaspi ?		

On the other hand, the Victoria Alps contain several northern European forms which have not been found in Tasmania, as—

Turritis glabra.	Lysimachia vulgaris.	Carex Buxbaumii.
Sagina procumbens.	Alisma Plantago.	Carex vulgaris (*fid. Muell.*)
Myriophyllum verticillatum.	Actinocarpus.	Carex canescens ditto.
Alchemilla vulgaris.	Hydrilla dentata.	Carex echinata ditto.
Samolus Valerandi.	Carex stellulata.	Carex Pyrenaica.

The New Zealand Flora is another which enters proportionately much more largely into the Tasmanian than into the Australian, nearly 200 of the genera and 170 of the species of Tasmania being common to New Zealand; and these countries further contain various representative genera and species, which will be found in the Introductory Essay to the 'New Zealand Flora,' and in the section of this Essay devoted to a comparison of the New Zealand and Australian Floras.

From the higher latitude of Tasmania, and its loftier mountains, it contains further a larger proportion of antarctic plants, nearly 100 genera and 56 species being common to this island and the groups south of New Zealand, Fuegia, the Falkland Islands, etc.

A strict comparison of the continental Australian and Tasmanian Floras cannot be fully carried out, until much larger suites of specimens from both countries have been selected and compared. It is evident that many of the plants that rank as peculiar to Tasmania, are slightly though permanently altered forms, no less than 100 of the 1063 being so considered, with more or less certainty or plausibility, by Mueller or Archer or myself, and some by all of us. To enter into a discussion of them here would be quite useless.

Another interesting subject of detail, requiring fuller materials, is the alpine Flora of Tasmania, upon which Mueller's Victorian Alps collections have thrown so much light. I find, on a rough estimate, that there are 200 alpine and subalpine species in Tasmania (of which half are alpine); considering as such those which are most prevalent in or confined to altitudes above 3,000 feet: of these 30 are probably altered forms of lowland plants; 120 are of Australian genera (10 of them are probably varieties); about 10 are of New Zealand genera; 55 are of European genera (17 of them probably varieties); and 25 are Antarctic forms.

This proportion of varieties amongst the alpine and subalpine plants, amounting as it does to 15 per cent., is very large; the proportion amongst the lowland plants being considerably under 10 per cent. The small proportion of varieties amongst the alpines belonging to Australian genera compared with those of European genera is also worthy of notice, as an exemplification of an observation made by Mr. Darwin, that the species of widely distributed genera are more variable than those of local genera.

The locality indicated by the letters "Ch." as the habitat of many Tasmanian plants collected by Mr. Archer, consists of a tract of country (in which is included his estate of Cheshunt, about ten miles south-west of Deloraine and 600 feet above the sea), extending southerly from Mount Gog, on

the Mersey, to the Falls of the Meander, and westerly from Quamby's Bluff to the Lobster Rivulet; the whole comprising an area of about 400 square miles.

The rocks of the northern part of this tract, including Mount Gog, are chiefly quartzite; and the remainder, including a portion of the Western Mountains, elevated fully 4,000 feet, are for the most part basalt. Immediately above Cheshunt, to the south-west, rises an offset of the western mountains, named Cumming's Head, along the north-east base of which extends a tract of sandstone and fossiliferous limestone, which is the habitat of nearly all Mr. Archer's cryptogams.

This district has already produced nearly 550 flowering plants, or rather more than half of all that are known to inhabit Tasmania. The character of the Cheshunt Flora is, on the whole, that of a cold hilly region, approaching, in many respects, to the subalpine, and is hence even less Australian than that of all Tasmania is. The absence of all but four *Rhamneæ*, the paucity of *Restiaceæ*, *Myrtaceæ*, *Liliaceæ*, and *Leguminosæ*, the abundance of *Orchideæ*, *Compositæ*, and *Epacrideæ*, are amongst the most noticeable features.

§ 9.

On the New Zealand and Polynesian features of the Australian Vegetation.

I have already remarked that these features, in so far as they are peculiar, are confined to the east and south-east coasts of Australia, and chiefly to the temperate regions, including Tasmania. There is a great difference between the temperate and tropical Floras of eastern Australia in respect to the character of their non-endemic genera and species, for the former appears to have received immigrants from New Zealand and the Antarctic regions, whilst the latter contains an assemblage of forms common to itself, India, and the Pacific. There is, however, no evidence in either case that the migration has been in one direction more than in another: Tasmania may once have been peopled by New Zealand and antarctic forms, before the Australian vegetation spread over it and replaced these; and Australia itself may have derived its peculiar features from some Pacific islands which have since been overrun by an Indian vegetation. I have therefore not subdivided this Section, but shall regard the affinities, both tropical and temperate, under the same point of view.

To the eastward of Australia are various groups of islands so arranged as to form a sort of rude outlying girdle to that continent. Beginning from the northward, these are the Solomon's Islands, New Hebrides, New Caledonia, Norfolk Island, and the New Zealand group; to which might be added Eastern New Guinea, the Louisiade Archipelago, and New Ireland, but I know very little of their botany.

The common botanical feature of all of these archipelagos, that lie to the north and east of the New Hebrides, and indeed of all the Polynesian groups westward of Juan Fernandez and the Galapagos (which are wholly American), is that they are peopled mainly by Indian and Australian genera, and in a very slight degree by American; but these Floras (Indian, Australian, and American) are represented in very different proportions in different groups; and I have observed (note at p. xvi.), that there are in this respect considerable anomalies in the Floras of contiguous archipelagos, those immediately to the eastward of New Caledonia* being remarkably deficient in Australian genera.

* In the only published volume of Asa Gray's 'Botany of Wilkes's Exploring Expedition,' I have found the Fiji, Navigators', Friendly, and Society Islands to be represented by upwards of 140 genera of *Thalamifloræ* and *Calycifloræ* (208 species). Only 26 genera are not Indian, and almost all of them are either new or confined to these groups; nor do I find one characteristic Australian plant amongst them, except a phyllodineous *Acacia*.

Commencing with the New Hebrides and New Caledonia, I find, that out of a list of scarcely 100 species known to me, there are no less than 12 markedly Australian generic types, viz. *Disemma, Eriostemon, Kennedya*, phyllodineous *Acaciæ*, *Leptospermum, Bæckia, Metrosideros, Didiscus, Coprosma, Cassinia, Leucopogon, Dracophyllum, Lomatia, Stenocarpus, Grevillea, Exocarpus, Casuarina, Araucaria, Microtis, Lyperanthus, Geitonoplesium, Stypandra, Lamprocarya.*

Norfolk Island, which lies intermediate between the New Hebrides and New Zealand, presents a Flora of intermediate character. Besides containing many New Zealand plants not hitherto found in the New Hebrides, it contains the following Australian types not found in New Zealand:—*Jasminum gracile, Exæcaria Agallocha, Myrsine crassifolia, Pimelea linifolia, Achyranthes canescens, Araucaria, Geitonoplesium cymosum.*

New Zealand presents a long list of Australian genera, including many that are very characteristic of that continent, but wholly wants some of the most extensive and widely distributed (both in area and elevation) of these, as *Eucalyptus, Acacia, Stylidium, Casuarina, Callitris, Xyris, Xerotes, Thysanotus, Hibbertia, Pleurandra, Banksia, Dryandra, Grevillea, Hakea.*

At p. xxxvii. I have enumerated the 23 largest Australian genera, all containing from 50 to upwards of 200 species; of these no less than 15 have no New Zealand representative, and all but 2 have very few indeed. In other words, of the 23 Australian genera which number upwards of 50 species each, and which together include about 2,000 species, only 8 are found in New Zealand, and of these, *Drosera, Dodonæa, Helichrysum,* and *Leucopogon,* are all widely distributed elsewhere; of the 7 Australian genera, with upwards of 100 species each, only *Leucopogon* is a New Zealand one.

It is even more remarkable that most of the highly characteristic Australian Orders are wholly or nearly absent in New Zealand: thus, instead of 100 genera and 1,000 species of *Leguminosæ* there are but 4 genera, all but one different (*Clianthus*), and 8 species, all different. Of *Myrtaceæ,* with 60 Australian genera and 600 species, there are but 4 genera and 15 species in New Zealand. The 5 Australian genera (including 100 species) of *Dilleniaceæ* have no representative, nor has the Order; and of *Stylidieæ,* in lieu of 5 genera and 115 species, there is but one genus, and that antarctic. Of *Goodeniaceæ,* which in Australia has 20 genera and 230 species, there is but one species in New Zealand, and that a salt-marsh plant also common to Chili and Tasmania. Lastly, there are no representatives whatever of—

Capparideæ.	Frankeniaceæ.	Buettneriaceæ.	Xyrideæ.
Polygaleæ.	Tremandreæ.	Casuarineæ.	Hæmodoraceæ.

and very few of—

Stackhousieæ.	Santalaceæ.	Verbenaceæ.	Loganiaceæ.
Myoporineæ.	Irideæ.	Rhamneæ.	

To put this is in another point of view, I will give a comparative table of the relative magnitude of the 9 largest Natural Orders in each country, which Orders include upwards of half the species in each, and from which it will be seen that only 5 of the New Zealand Orders appear in the other lists.

New Zealand.	*Australia.*	*Tasmania.*
1. Compositæ.	Leguminosæ.	Compositæ.
2. Cyperaceæ.	Myrtaceæ.	Orchideæ.
3. Gramineæ.	Proteaceæ.	Epacrideæ.
4. Scrophularineæ.	Compositæ.	Leguminosæ.

New Zealand.	*Australia.*	*Tasmania.*
5. Orchideæ.	Gramineæ.	Cyperaceæ.
6. Rubiaceæ.	Cyperaceæ.	Gramineæ.
7. Epacrideæ.	Epacrideæ.	Myrtaceæ.
8. Umbelliferæ.	Goodeniaceæ.	Liliaceæ.
9. Ranunculaceæ.	Orchideæ.	Proteaceæ.

Another remarkable difference between these Floras is afforded by certain American genera being found in each, but which are not common to both. Of these the most striking are—

New Zealand.			*Australia and Tasmania.*	
Drimys.	Fuchsia.	Callixene.	Eucryphia.	Styloncerus.
Coriaria.	Calceolaria.	Gaimardia.	Œnothera.	Pernettya.
Edwardsia.	Thuja.	Rostkovia.	Flaveria.	Prionotes.

So too with regard to the European genera and species, there are certain temperate and northern species found in New Zealand but not in Australia, such as—

Taraxacum officinale, Veronica Anagallis, Sparganium natans, Agrostis canina.

Turning now to the points of affinity betwen Australia and New Zealand, these are so numerous and decided as to render the dissimilarities all the more singular.

In the first place, there is no New Zealand Order absent from Australia except *Coriarieæ*, *Brexiaceæ*, and *Chloranthaceæ*, which are single genera rather than Orders. Of the 282 genera of Phænogams in New Zealand, 240 are also Australian, and 60 are almost confined to these two countries. The greatest amount of generic affinity exists in three of the largest Orders in each, viz. *Compositæ*, *Orchideæ*, and *Gramineæ*, which may be considered generically identical in both. To this category of resemblances also belong the antarctic genera and representative genera, many of which are also found in America, and which will be hereafter considered. Of these 240 genera, by far the larger proportion are confined to eastern Australia, not one being exclusively western Australian.

Descending to species, I find that 216, or one-fourth of the New Zealand Phænogams, are natives of Australia,* and of these 115 are confined to these two countries. Of the remaining 101, 77 are common to America, 75 to India, and 52 to Europe. The comparatively small number of these that are common to India, and greater number common to America, is a remarkable fact, considering the relative position of these countries; and the large number of European genera is no less so.

Another interesting anomaly is, that of the 115 species peculiar to Australia and New Zealand, only 26 belong to genera peculiar to those countries, and only 6 to the long list of Australian genera that contain upwards of 20 species each. Again, upwards of 20 of these 115 are scarce and chiefly alpine plants in both countries, occupying comparatively very small areas; whereas of the 101 that are found in other lands besides Australia and New Zealand, only 5 or 6 are alpine, and most of these are antarctic also.

Thus, under whatever aspect I regard the Flora of Australia and New Zealand, I find all attempts to theorize on the possible causes of their community of feature frustrated by anomalies in distribution such as I believe no two other similarly situated countries in the globe present. Everywhere else I recognize a parallelism or harmony in the main common features of contiguous Floras, which

* The majority of these will be found in the Tasmanian Classified List at p. lvi., with the indication of their being natives of New Zealand.

conveys the impression of their generic affinity at least being effected by migration from centres of dispersion in one of them, or in some adjacent country. In this case it is widely different. Regarding the question from the Australian point of view, it is impossible in the present state of science to reconcile the fact of *Acacia*,* *Eucalyptus*, *Casuarina*, *Callitris*, etc., being absent in New Zealand, with any theory of transoceanic migration that may be adopted to explain the presence of other Australian plants in New Zealand; and it is very difficult to conceive of a time or of conditions that could explain these anomalies, except by going back to epochs when the prevalent botanical as well as geographical features of each were widely different from what they are now. On the other hand, if I regard the question from the New Zealand point of view, I find such broad features of resemblance, and so many connecting links that afford irresistible evidence of a close botanical connection, that I cannot abandon the conviction that these great differences will present the least difficulties to whatever theory may explain the whole case. I shall again allude to this point after discussing the antarctic and European features of Australia.

Between Norfolk Island and Australia a few small islands rise like specks in the ocean, and these, too, tell a tale of distribution. Lord Howe's Island and the Middleton group, in the parallels of 28° and 32° south, have both been botanized in by the officers of the 'Herald' (Captain Denham's Pacific Exploring Expedition), and their Flora is of an intermediate character between that of Australia, New Zealand, and Norfolk Island, some species being common to each, and the rest, though quite distinct, being closely allied to the plants of these countries.

§ 10.

On the Antarctic Plants of Australia.

From the geographical position of Australia, no less than from the altitude of its southern mountains, it is well placed for the maintenance of those types of vegetation which I have denominated Antarctic. These, it must be remembered, are not so called because they really inhabit the country of that name beyond the Polar circle, but because in a botanical point of view, no less than in position relative to the south temperate Flora, they represent the Arctic Flora. They might indeed almost be called alpine plants, for many which are found at the level of the sea in the so-called Antarctic islands, also ascend the mountains of more genial latitudes. An alpine vegetation, however, in the tropics especially, is supposed to commence only where the forest is replaced by low brushwood; whereas, owing to the uniformity and humidity of the high southern latitudes, an arboreous vegetation there encroaches upon the limits of perpetual ice. In the longitude of Cape Horn, on the mountains of Fuegia, of the Middle Island of New Zealand, and of Australia, the belt of country occupied by low and chiefly herbaceous plants, that intervenes between the arboreous vegetation and the extinction of phænogamic life, is a very narrow one indeed compared with what analogous regions the Alps, Andes, Himalaya, or Arctic latitudes present.

In discussing the antarctic vegetation of Australia, I shall have to adopt a style that appears to indicate that this Flora is an immigrant, whereas it may, to a considerable extent, both in Australia and elsewhere, consist of altered forms of the plants of that continent, which have migrated from

* There are no climatic or other reasons against these genera flourishing in New Zealand when introduced there. Some introduced Australian plants have already become naturalized in New Zealand; but upon this point I hope to collect more full evidence.

it to the Antarctic regions; just as the endemic alpine Floras of Tasmania and Victoria are to an appreciable degree composed of altered lowland species, or *vice versâ*. Taking for example such an eminently antarctic genus as *Acæna*,† which is not known in the northern hemisphere, except in America and the Sandwich Islands (but which is elsewhere in that hemisphere represented by *Poterium* and *Sanguisorba*), its distribution is very wide and disconnected, yet it is so universally present in all high southern lands, both under the forms of temperate, alpine, and antarctic species, that it is impossible to regard it under any other category than the vague one of antarctic.

Premising that the so-called antarctic vegetation is that of the islands south of New Zealand, West Chili south of Cape Tresmontes, Fuegia, the Falklands and other islands south of them, Tristan d'Acunha, and Kerguelen's Land, I shall proceed to indicate which of the plants of these countries are actually present, or are represented by allied genera or species in Australia.—E prefixed distinguishes the European species.

Australia and Tasmania.	Islands south of New Zealand.	Fuegia, etc., Tristan d'Acunha, and Kerguelen's Land.
Caltha introloba, *Muell.*	C. Novæ-Zelandiæ, *H.f.*	C. sagittata, *Cav.*
Tasmania aromatica, *Br.*	D. *axillaris, *Forst.*	Drimys Winteri, *Forst.*
E Cardamine hirsuta, *L.*	C. hirsuta, *L.*	C. hirsuta, *L.*
Drosera Arcturi, *Hook.*	D. Arcturi, *Hook.*	D. uniflora, *Willd.*
E Stellaria media, *Sm.*	S. media, *Sm.*	S. media, *Sm.*
E Sagina procumbens, *L.*		S. procumbens, *L.*
Colobanthus Billardieri, *Fenzl.*	C. Billardieri, *Fenzl.*	C. crassifolius, *H.f.*
Colobanthus subulatus, *H.f.*	C. subulatus, *H.f.*	C. subulatus, *H.f.*
E Geranium dissectum, *L.*		G. dissectum, *L.*
Geranium potentilloides, *L'Hérit.*	G. potentilloides, *L'Hérit.*	G. Patagonicum, *H.f.*
Pelargonium Acugnaticum, *Pet. Th.*	P. *Acugnaticum, *Pet. Th.*	P. *Acugnaticum, *Pet. Th.*
Oxalis Magellanica, *Forst.*	O. Magellanica, *Forst.*	O. Magellanica, *Forst.*
E Potentilla anserina, *L.*	P. anserina, *L.*	P. anserina, *L.*
E Geum urbanum, *L.*	G. *urbanum, *L.*	G. urbanum, *L.*
Acæna Sanguisorba, *Vahl.*	A. Sanguisorba, *Vahl.*	A. lævigata, *Ait.*
E Epilobium tetragonum, *L.*	E. *tetragonum, *L.*	E. tetragonum, *L.*
Myriophyllum elatinoides, *Gaud.*	M. *elatinoides, *Gaud.*	M. elatinoides, *Gaud.*
Gunnera cordifolia, *H.f.*	G. *monoica, *Bl.*	G. Magellanica, *Lam.*
E Callitriche verna, *L.*	C. verna, *L.*	C. verna, *L.*
E Montia fontana, *L.*	M. fontana, *L.*	M. fontana, *L.*
Crantzia lineata, *Nutt.*	C. *lineata, *Nutt.*	C. lineata, *Nutt.*
Apium australe, *Pet. Th.*	A. *australe, *Pet. Th.*	A. australe, *Pet. Th.*
Oreomyrrhis Colensoi, *H.f.*	O. *Colensoi, *H.f.*	O. andicola, *Endl.*
Coprosma pumila, *H.f.*	C. pumila, *H.f.*	
Nertera depressa, *B. & S.*	N. depressa, *B. & S.*	N. depressa, *B. & S.*
Trineuron scapigerum, *Muell.*	T. spathulatum, *H.f.*	
Scleroleima forsteroides, *H.f.*		Abrotanella emarginata, *Cass.*

† One species (*A. pinnatifida*, R. & P.), is found both in Chili and in California, but not in any intermediate latitude. California, Mexico, and the Sandwich Islands are almost the only habitats of the genus in the northern hemisphere.

* An asterisk indicates those species which, being common to Tasmania and Fuegia, etc., are found on the mountains of New Zealand, though not in the islands south of it.

	Australia and Tasmania.	Islands south of New Zealand.	Fuegia, etc., Tristan d'Acunha, and Kerguelen's Land.
	Leptinella intricata, *H.f.*	L. plumosa, *H.f.*	L. scariosa, *Cass.*
	Erechtites prenanthoides, *DC.*	E. prenanthoides, *DC.*	
	Forstera bellidifolia, *Hook.*	F. clavigera, *H.f.*	F. muscifolia, *Willd.*
	Selliera radicans, *Cav.*	S. *radicans, *Cav.*	S. radicans, *Cav.*
	Pernettya Tasmanica, *H.f.*		P. pumila, *Hook.*
	Prionotes cerinthoides, *Lab.*		P. Americana, *Hook.*
	Gentiana montana, *Forst.*	G. montana, *Forst.*	G. Magellanica, *Gaud.*
E	Calystegia sepium, *Br.*	C. *sepium, *Br.*	C. sepium, *Br.*
E	Limosella aquatica, *L.*	L. *aquatica, *L.*	L. aquatica, *L.*
	Ourisia integrifolia, *Br.*	O. *macrophylla, *Hook.*	O. Magellanica, *Juss.*
	Samolus littoralis, *Br.*	S. *littoralis, *Br.*	S. littoralis, *Br.*
	Plantago Brownii, *Rap.*	P. Brownii, *Rap.*	P. barbata, *Forst.*
E	Chenopodium glaucum, *L.*	C. *glaucum, *L.*	C. glaucum, *L.*
	Lomatia tinctoria, *Br.*		L. ferruginea, *Br.*
	Drapetes Tasmanica, *H.f.*	D. Lyallii, *H.f.*	D. muscosa, *Lamk.*
	Fagus Gunnii, *H.f.*		F. Antarctica, *Forst.*
	Fagus Cunninghamii, *Hook.*	F. Menziesii, *H.f.*	F. betuloides, *Mirb.*
	Astelia alpina, *Br.*	A. linearis, *H.f.*	A. pumila, *Br.*
	Triglochin triandrum, *Mirb.*	T. *triandrum, *Mirb.*	T. triandrum, *Mirb.*
	Juncus planifolius, *Br.*	J. *planifolius, *Br.*	J. planifolius, *Br.*
	Oreobolus Pumilio, *Br.*	O. Pumilio, *Br.*	O. obtusangulus, *Gaud.*
	Carpha alpina, *Br.*	C. *alpina, *Br.*	C. schœnoides, *B. & S.*
E	Isolepis pygmæa, *Kth.*	I. *pygmæa, *Kth.*	I. pygmæa, *Kth.*
	Carex appressa, *Br.*	C. appressa, *Br.*	
	Hierochloe redolens, *Br.*	H. redolens, *Br.*	H. redolens, *Br.*
E	Deschampsia cæspitosa, *Pal.*	D. cæspitosa, *Pal.*	D. cæspitosa, *Pal.*
E	Trisetum subspicatum, *Pal.*	T. subspicatum, *Pal.*	T. subspicatum, *Pal.*
E	Festuca duriuscula, *L.*	F. *duriuscula, *L.*	F. duriuscula, *L.*
	Festuca littoralis, *Lab.*	F. littoralis, *Lab.*	

The most curious point in this list is the number of European species it contains, amounting to seventeen, of which most are British; there are besides two other species which inhabit the north temperate zone of the New World, *Triglochin triandrum* and *Crantzia lineata; Apium australe* is in some of its states with difficulty distinguished from *A. graveolens.*

The genera that are most characteristic of the Antarctic regions amongst them are,—*Colobanthus, Acæna, Donatia, Nertera, Forstera, Leptinella, Ourisia, Drapetes, Fagus, Oreobolus,* and *Carpha.* Only one (*Lomatia*) can be said to betray any generic affinity between the peculiar Flora of Australia and the Antarctic regions; though *Forstera,* as belonging to *Stylidieæ,* may be classed with Australian representatives.

§ 11.

On the South African features of Australian Vegetation.

The relations between the Floras of Australia and of the same latitudes in Africa, are of a very different character from those that exist between it and Polynesia, or India, etc., or even Europe; for whereas there is a very definable affinity traceable in the presence and abundance of some peculiar Orders, there is very little generic affinity in those Orders, and scarcely any specific identity.

My data for the African Flora are chiefly derived from my friend Dr. Harvey's communications, his 'Genera of South African Plants,' Drége and Meyer's 'Zwei Pflanzen-geographische Documente' (Flora, 1843), the Niger Flora, and the Natal, West African, and Mauritius plants in the Herbarium at Kew.

With regard to the tropical Floras of Australia and Africa, their agreement is in rather less than 300 genera, and in about 200 species that are without exception common to India also, and hardly any of which belong to those genera or natural families* that are characteristic of the South African or Australian Flora. This subject therefore requires no further illustration than it has received under the Indian chapter.

With regard to the temperate South African Flora, it is perhaps as widely different from the tropical as the temperate Australian is from that of the Malayan Islands; and an extraordinary number of species, many of them belonging to a few genera and orders elsewhere rare, are massed towards the south extreme of Africa, and there confined to a tract of land of varying width, interposed between the sea and a desert interior.

The most conspicuous characters that extratropical South Africa presents in common with Australia, are the abundance of species of the following Orders, many of which being shrubby, give in certain districts of each country a character to the landscape.

Proteaceæ.	Polygaleæ.	Rutaceæ.
Compositæ.	Restiaceæ.	Thymeleæ.
Irideæ.	Epacrideæ, Ericeæ.	Santalaceæ.
Hæmodoraceæ.	Decandrous Papilionaceæ and tribes Podalyrieæ and Loteæ.	Anthospermous Rubiaceæ.
Buettneriaceæ.		

All these Orders are far more abundantly represented in Australia (especially south-western) and South Africa than in any other part of the world, added to which by far the greater number of the known genera and species of *Proteaceæ* and *Restiaceæ* are confined to these two countries. Other marks of affinity are the *Cycadeæ*, the genus *Encephalartos* (to which Mueller reduces *Macrozamia*) being common to both; *Cyphiaceæ* (according to Brown a suborder of *Goodeniaceæ*) are almost confined to South Africa. Numerous terrestrial *Orchideæ, Droseraceæ, Zygophylleæ, Liliaceæ, Smilaceæ,* and *Capparideæ;* the genera *Pelargonium* and *Mesembryanthemum,* besides *Metrosideros, Acæna, Tetragonia, Weinmannia, Sarcostemma, Sebæa, Callitris,*† *Anguillaria, Restio, Carpha, Uncinia,* and *Ehrharta.*

* As exceptions may rank the few *Proteaceæ* said to exist in Abyssinia, which however belong to genera widely different from the Australian. The late Professor A. Richard gave me to understand (Preface to 'Flora Antarctica,' vol. ii. p. 210) that there were many representatives of the South African peculiarities in Abyssinia, but I find they are not so numerous as I was led to suppose.

† I include *Frenela* and *Widdringtonia* under *Callitris,* one species of which is found in North Africa.

The rarity in both of *Aroideæ, Laurineæ,* and all *Rubiaceæ* except the *Anthospermeæ,* is also worthy of notice. With regard to the Natural Orders enumerated above, their genera are almost unexceptionally different in the two countries. I find that of 1,000 South African genera of flowering plants, only about 280 are Australian; of these about 160 are also common to Europe, and 130 to India, leaving *Callitris, Encephalartos, Restio, Hypolæna,* and *Anguillaria,* confined to South Africa and Australia, and 10 more common to these countries, together with New Zealand and extratropical America.

On the other hand, South Africa contains upwards of 220 European genera, of which 80 are not Australian, and of these upwards of 60 are north temperate forms. We have hence the very curious fact that in point of numbers Australia represents generically the European Flora better than South Africa does; but that the South African Flora contains a larger proportion of very northern European genera (not species) than Australia does. This is no doubt because many of the so-called European genera of Australia are more properly Asiatic, and spread thence in both directions, towards Europe and towards Australia.

Before dismissing this subject, it is as well to glance at the differences between these Floras, which may shortly be summed up. South Africa abounds in *Campanulaceæ,* which are very rare in Australia, where the very closely allied Orders *Stylidieæ* and *Goodeniaceæ* abound. The true *Ericeæ,* which swarm in certain districts of South Africa, are all but wholly absent in Australia, being represented there by their suborder *Epacrideæ.* Succulents are, comparatively, extremely rare in Australia, which almost wholly wants those conspicuous features of South African vegetation the *Crassulaceæ, Ficoideæ,* fleshy *Asclepiadeæ, Liliaceæ* (Aloes), and *Euphorbieæ.*

I have given (p. xxxiii.) a list of the five Orders which abound more in South Africa than in any other country but Australia, and are therefore highly characteristic of both these. I shall now give the contrasting ordinal dissimilarities of each.

The following Orders are represented in the South African Flora, but are either comparatively rare or absent in Australia :—

Fumariaceæ, absent in Australia.
Resedaceæ, ditto.
Bixaceæ.
Tamariscineæ, ditto.
Geraniaceæ.
Oxalideæ.
Caryophylleæ.
Ficoideæ.
Rosaceæ.
Bruniaceæ, ditto.
Loaseæ, ditto.
Penæaceæ, ditto.
Begoniaceæ, ditto.
Crassulaceæ.
Valerianeæ, ditto.
Dipsaceæ, absent in Australia.
Arctotideæ (tribe of *Comp.*).
Ericeæ.
Campanulaceæ.
Stilbineæ (*Verben.*), absent in Australia.
Selagineæ (*Verben.*), ditto.
Asclepiadeæ.
Podostemaceæ, ditto.
Sarureæ, ditto.
Rafflesiaceæ, absent in Australia.
Cytineæ, ditto.
Betulaceæ, ditto.
Salicineæ, absent in Australia.
Hypoxideæ.

Temperate Australia contains the following Orders that are rare or absent in South Africa :—

Dilleniaceæ, absent in South Africa.
Magnoliaceæ, ditto.
Monimiaceæ. ditto.
Sapindaceæ.
Tremandreæ, absent in South Africa.
Pittosporeæ.
Stackhousieæ, ditto.
Haloragеæ.

Myrtaceæ.		Labiatæ.	
Caprifoliaceæ, absent in South Africa.		Lentibularineæ.	
Goodeniaceæ,	ditto.	Plantagineæ, absent in South Africa.	
Stylidieæ,	ditto.	Cupuliferæ,	ditto.
Brunoniaceæ,	ditto.	Casuarineæ,	ditto.
Epacrideæ,	ditto.	Coniferæ.	
Loganiaceæ.		Xerotideæ,	ditto.
Myoporineæ,	ditto.	Phylidreæ,	ditto.

It is singular that there should be exactly the same number (sixteen) of Orders absent in each country; of these, however, three Australian ones are confined to the south-eastern part of that continent, *Magnoliaceæ*, *Monimiaceæ*, and *Caprifoliaceæ*, which is in accordance with the facts I have elsewhere indicated, that the affinity between the Floras of South-west Australia and South Africa is very markedly greater than between that country and South-east Australia.

I shall return to the consideration of the European genera of South Africa in the following section of this Essay.

§ 11.

On the European Features of the Australian Flora.

In one respect this is by far the most difficult subject to treat of to the satisfaction of many persons interested in the study of the distribution of plants; for situated as Australia is, at the antipodes of Europe, the presence in it of many forms common to both, whether generic or specific, affords so strong an argument in favour of there being many centres of creation for each vegetable form, that I cannot expect the believers in that doctrine to follow me far. I have given my own reasons for dissenting from that view and inclining to the opposite one, that variation will account for change of species and genera; that the force of variation being a centrifugal one tends to diversity of forms and opposes reversion; that Darwin's theory of natural selection accounts for the temporary stability of many forms we call species; that the destruction of species by natural causes resolves species into genera, etc.; and that if we allow time enough, these several operations may have worked together and produced, out of what would otherwise be to us a homogeneous series of vegetable forms, a series broken up into varieties, species, and genera, all of unequal value, and of multiplied cross-affinities. I now pursue the subject of the European affinities of the Australian Flora in subjection to these views, not because I insist that they are right, nor because I expect to explain the facts by them, but because I conceive these hypotheses to be, in the present state of science, as legitimately tenable as those of absolute creations and multiplied centres, and far more suggestive to future inquirers of fresh ideas, that may be worked into one class of hypotheses or the other.

The following is a list of the European genera and species hitherto discovered in Australia. I have indicated by *As.* those which, though found in Europe, are so scarce there, and so much more characteristic of Asia, that they cannot be considered as direct instances of affinity between Australia and Europe; and by *Trop.* those genera that are only found in tropical or subtropical Australia. Those marked with an asterisk are possibly introduced.

Ranunculus *aquatilis*.
—— *parviflorus*.
Anemone.
Clematis.
Myosurus.
Caltha.
As. Nelumbium *speciosum*. Tr
As. Nymphæa *Lotus*. Trop.
Papaver.
Lepidium **ruderale*.
Draba *nemoralis*.
Cardamine *hirsuta*.
—— *pratensis*.
Arabis.
Barbarea *vulgaris*.
Nasturtium *terrestre*.
Senebiera. Trop.
Erysimum.
Hutchinsia *procumbens*.
Sisymbrium *thalianum*.
Turritis *glabra*.
Thlaspi?
As. Capparis *spinosa*.
Cleome.
Viola.
Drosera.
Polygala.
Frankenia.
*Gypsophila *tubulosa*.
Spergularia *rubra*.
Scleranthus.
Stellaria *media*.
—— *glauca*.
Sagina *procumbens*
Linum.
Elatine.
Lavatera.
As. Malva. Trop.
As. Sida. Trop.
As. Hibiscus *Trionum*.
As. Vitis. Trop.
Geranium *dissectum*.
Oxalis *corniculata*.
Hypericum.
Zygophyllum.
As. Tribulus. Trop.
As. Celastrus. Trop.
As. Zizyphus. Trop.
As. Phaseolus. Trop.
Lotus *corniculatus*.
Trigonella.
As. Cassia. Trop.
As. Sophora. Trop.
As. Psoralea. Trop.
Geum *urbanum*.
Potentilla *anserina*.
Rubus.
Alchemilla *arvensis*.
—— *vulgaris*.
Callitriche *verna*.
—— *platycarpa*?
Ceratophyllum *demersum*.
As. Ludwigia. Trop.
As. Ammannia. Trop.
Epilobium *tetragonum*.
Lythrum *Salicaria*.
—— **hyssopifolium*.
As. Myrtus. Trop.
Montia *fontana*.
Mesembryanthemum.
As. Glinus *lotoides*.
As. Portulaca *oleracea*.
Tillæa.
Hydrocotyle *vulgaris*.*
Helosciadium?
Sium *latifolium*.
Eryngium.
Apium.
Daucus.
Seseli.
As. Loranthus. Trop.
As. Viscum. Trop.
Sambucus.
Asperula.
Galium.
Erigeron.
Conyza *ambigua*.
Bidens *cernua*.
—— *pilosa*.
Cotula *coronopifolia*.
As. Myriogyne *minuta*.
Antennaria.
Helichrysum.
Gnaphalium *luteo-album*.
Senecio.
Sonchus *asper*.
Picris *hieracioides*.
Lobelia.
Wahlenbergia.
As. Olea. Trop.
As. Jasminum.
As. Diospyros. Trop.
Gentiana.
Villarsia.
Erythræa.
As. Cynanchum. Trop.
Cuscuta.
As. Cressa *Cretica*.
As. Convolvulus *althæoides*?
Calystegia *sepium*.
—— *Soldanella*.
As. Ipomœa. Trop.
Solanum *nigrum*
As. Physalis. Trop.
As. Lycium.
As. Heliotropium. Trop.
Myosotis.
Cynoglossum.
As. Echinospermum. Trop.
Eritrichium.
As. Tournefortia, Trop.
Euphrasia.
Veronica *serpyllifolia*.
Limosella *aquatica*
As. Gratiola.
Verbena *officinalis*.
As. Lippia *nodiflora*. Trop
As. Vitex. Trop.
Mentha.
Lycopus *Europæus*
Prunella *vulgaris*
Scutellaria.
Teucrium.
Ajuga.
Utricularia.

* Introduced on the authority of Brown's list in the Appendix to Flinders's Voyage.

Lysimachia *vulgaris*.
Samolus *Valerandi*.
As. Plumbago. Trop.
Statice.
Plantago.
As. Boerhaavia. Trop.
Polygonum *minus*.
—— *aviculare*.
—— *mite*.
—— *lapathifolium*.
Rumex.
Chenopodium *glaucum*.
—— *murale*.
Blitum *virgatum*.
Atriplex **rosea*.
Kochia.
Suæda *maritima*.
Echinopsilon.
Halocnemon.
Arthrocnemon *Arbuscula*.
Salsola *Kali*.
Euxolus *viridis*.
As. Alternanthera *nodiflora*.
As. Achyranthes. Trop.
Thesium.
As. Euphorbia *Chamæsyce*. Tr.
As. Croton. Trop.
Urtica.
Parietaria *debilis*.
As. Ficus. Trop.
Fagus.
As. Ephedra. Trop.
Vallisneria *spiralis*.
As. Hydrilla *dentata*.
As. Habenaria. Trop.
Spiranthes.
Alisma *Plantago*.
Actinocarpus *Damasonum?*
Triglochin.
Zannichellia *palustris?*
Naias *major?*
Ruppia *maritima*.
Zostera *marina*.
Posidonia.
Potamogeton *natans*.
Potamogeton *crispus*.
Potamogeton *prælongus?*
—— *perfoliatus*.
—— *pectinatus*.
—— *obtusifolius?*
Lemna *minor*.
—— *trisulca*.
Sparganium *ramosum*.
Typha *angustifolia*.
As. Asparagus. Trop.
Smilax.
Juncus *bufonius*.
—— *communis*.
—— *maritimus*.
Luzula *campestris*.
As. Eriocaulon.
As. Fuirena. Trop.
As. Fimbristylis, Trop.
Cyperus *rotundus*.
—— *mucronatus*.
—— *pygmæus*.
—— *difformis*.
Elæocharis *palustris*.
—— *acicularis*.
Scirpus *mucronatus*.
—— *triqueter*.
—— *maritimus*.
—— *Rothii*.
—— *lacustris*.
Malacochæte *pectinata*.
Isolepis *setacea*.
—— *supina*.
—— *Saviana*.
—— *fluitans*.
Scirpus *lacustris*.
—— *maritima*.
—— *triqueter*.
As. Rhynchospora.
Cladium *Mariscus*.
Schœnus.
Carex *stellulata*.
—— *Buxbaumii*.
—— *vulgaris*.
—— *Pyrenaica*.
—— *echinata*.
—— *canescens*.
As. Leersia *ciliaris*.
Alopecurus *geniculatus*.
Hierochloe *borealis*.
As. Eriochloa *annulata*. Trop.
As. Digitaria *ciliaris*.
—— *sanguinalis*.
As. Panicum *eruciforme*.
—— *miliaceum*.
—— *repens*.
As. Oplismenus *Crus-galli*.
As. Lappago *racemosa*. Trop.
As. Setaria *glauca*. Trop.
—— *viridis*.
As. Cenchrus. Trop.
Stipa.
As. Aristida. Trop.
As. Sporobolus *commutatus*. Tr.
—— *diander*.
Apera.
Agrostis.
Polypogon **Monspeliensis*.
Deyeuxia.
Phragmites *vulgaris*.
As. Dactyloctenium *Ægyptiacum*.
As. Cynodon *Dactylon*.
Deschampsia *cæspitosa*.
Trisetum *subspicatum*.
As. Eragrostis. Trop.
Glyceria *fluitans*.
Koeleria *cristata*.
Festuca *duriuscula*.
—— **bromoides*.
Bromus *commutatus?*
Poa.
Triticum.
*Hordeum.
As. Imperata *arundinacea*.
As. Anthistiria. Trop.
As. Andropogon. Trop.
As. Chrysopogon. Trop.
As. Sorghum *Halepense*. Trop.
As. Ischæmum. Trop.
Lepturus *incurvatus?*
As. Ophiurus. Trop.
As. Rottbœllia. Trop.
As. Hemarthria. Trop.

Of the 227 genera and 148 species here enumerated, by far the larger proportion are natives of many other parts of the globe, including all those found also in Tropical India, but there is still left a list of 38 species so notably characteristic of northern Europe, and so rare, if present at all, in warm or southern Asia, that they at once challenge further investigation. These are, excluding such marsh- and water-plants as *Potamogeton, Scirpus, Isolepis, etc.*, and others, which inhabit all hot countries as well as cold :—

Draba *nemoralis*. All Europe, and Russian Asia.
Cardamine *pratensis*. Europe, Russian Asia, and Arctic America.
Hutchinsia *procumbens*. Europe, Western Asia, Mediterranean, Patagonia.
Sisymbrium *thalianum*. Europe, Russian Asia, and North America.
Stellaria *glauca*. Europe, Russian Asia, and North America.
Sagina *procumbens*. Europe, Russian Asia, Himalaya, North America, Fuegia.
Geranium *dissectum*. Europe, Russian Asia, North America, Fuegia.
Lotus *corniculatus*. Europe, Russian Asia.
Geum *urbanum*. Europe, Russian Asia, Himalaya, New Zealand, Fuegia.
Potentilla *anserina*. Europe, Russian and Central Asia, N. America, Arc. & Antarc. regions, N. Zeal.
Alchemilla *arvensis*. Europe, Western Asia.
Alchemilla *vulgaris*. Northern and Arctic Europe and Asia, Ceylon, and Peninsula of India.
Epilobium *tetragonum*. Temperate and Subarctic Europe, Asia, and N. and S. America, N. Zealand.
Lythrum *Salicaria*. Europe, North and Central Asia, North and South America, and South Africa.
Montia *fontana*. Europe, North Asia, North American Andes, New Zealand, Kerguelen's Land.
Sium *latifolium*. Europe, North Asia.
Bidens *cernua*. Europe, North Asia, Himalaya, North America.
Picris *hieracioides*. Europe, Central Asia, Himalaya, New Zealand.
Calystegia *sepium*. Temperate Europe, North Asia, North America, New Zealand, Fuegia.
Prunella *vulgaris*. Temperate Europe, Asia, North America, Himalaya.
Lycopus *Europæus*. Temperate Europe, Asia, North America, Himalaya.
Lysimachia *vulgaris*. Northern Europe and Russian Asia.
Samolus *Valerandi*. Europe, North Asia, Temperate and Tropical North and South America, Fuegia.
Alisma *Plantago*. Northern and Arctic Europe, Asia, America, and North-west India.
Actinocarpus *Damasonum*, var.? (*A. Damasonum*, in South-west Europe, Central Asia).
Juncus *communis*. Temperate northern hemisphere, India, South Africa, New Zealand.
Juncus *bufonius*. Temperate northern hemisphere, India.
Juncus *maritimus*. Temperate and North Europe, Asia, North America, New Zealand, Fuegia.
Luzula *campestris*. Temperate and Arctic Europe, Asia, America, New Zealand.
Carex *stellulata*. Temperate and Arctic Europe, Asia, America, New Zealand.
Carex *Buxbaumii*. Northern and Arctic Europe, Asia, America.
Alopecurus *geniculatus*. Europe, North and Central Asia, New Zealand.
Hierochloe *borealis*. Arctic Europe, Asia, America, New Zealand.
Deschampsia *cæspitosa*. Northern and Arctic Europe, Asia, Fuegia, New Zealand.
Trisetum *subspicatum*. Arctic and Alpine Europe, North America, Asia, America, Antarctic regions.
Glyceria *fluitans*. Temperate and Arctic Europe, Asia, America.
Kœleria *cristata*. Central and South Europe, N. Asia, Temperate N. America, New Zealand, Fuegia.
Festuca *duriuscula*. Temperate Arctic Europe, America, northern Asia, Andes, New Zealand, Fuegia.

With one exception (*Trisetum subspicatum*) these are all British, a great many are the only examples of their genus in Australia, and only three are water-plants. None of them are found

in any truly tropical climate, and a few only enter the temperate plains of north-western India. All of them are temperate plants in Australia, and several of them subalpine or alpine; few inhabit south-west Australia, and as a whole they are characteristic of the coolest parts of south-east Australia and Tasmania, the latter island alone possessing 28 out of the 37. New Zealand possesses 15 of them, and the Antarctic regions 13; but few are South African.

It is a singular fact that some of the best-marked of these plants do not inhabit any part of India, except the extreme north-western Himalaya, and others occur nowhere in the old world between northern Europe or Asia and Australia; one, *Alchemilla vulgaris*, though not Himalayan, is found on the Nilgiri mountains and those of Ceylon.

Neither New Zealand, temperate South America, nor South Africa, present so large an assemblage of well-marked European species, but these countries and the Antarctic islands contain several that are not found in Australia; and since we must look to one general cause for this southern migration of northern forms into all the south temperate lands, I shall add a list of all other such genera and species as are known to me.

Anemone.
decapetala, L. Fuegia.
Thalictrum. South Africa.
Berberis. Fuegia.
Corydalis. South Africa.
Fumaria. Ditto.
Draba.
incana. Fuegia.
Matthiola. South Africa.
Alyssum. Ditto.
Sinapis. Ditto.
Sisymbrium.
Sophia. Fuegia.
Reseda. South Africa.
Lychnis.
apetala ? Fuegia.
Dianthus. South Africa.
Silene. Ditto.
Cerastium.
arvense. Fuegia, etc.
Althæa. South Africa.
Erodium. Ditto.
Impatiens. Ditto.
Trifolium. Ditto.
Vicia. Fuegia.
Lathyrus.
maritimus. Fuegia.
Fragaria. South Chili.
Hippuris.
vulgaris, L. Fuegia.
Crassula. South Africa.
Sempervivum. South Africa.
Cotyledon. Ditto.
Ribes. Fuegia.
Saxifraga.
exarata. Ditto.
Chrysosplenium. Ditto.
Sanicula. South Africa.
Bupleurum. Ditto.
Pimpinella. Ditto.
Œnanthe. Ditto.
Seseli. Ditto.
Athamanta. Ditto.
Ptychotis. Ditto.
Ferula. Ditto.
Peucedanum. Ditto.
Laserpitium. Ditto.
Trinia. Ditto.
Torilis. Ditto.
Conium. Ditto.
Osmorrhiza. Fuegia.
Galium.
Aparine. Ditto.
Rubia. South Africa.
Valeriana. Fuegia.
Scabiosa. South Africa.
Erigeron.
alpinus. Fuegia.
Aster. Ditto.
Chrysocoma. South Africa.
Inula. Ditto.
Pulicaria. Ditto.
Chrysanthemum.
Pyrethrum.
Artemisia. South Africa.
Tanacetum. Ditto.
Ligularia. Ditto.
Hypochœris. Ditto.
Lactuca. Ditto.
Hieracium. Ditto, Fuegia.
Taraxacum.
Dens-leonis. Fuegia, N. Zeal.
Erica. South Africa.
Gentiana.
prostrata. Fuegia.
Anchusa. South Africa.
Datura. Ditto.
Orobanche. Ditto.
Linaria. Ditto.
Veronica.
Anagallis. New Zealand.
Bartsia. South Africa.
Sibthorpia. Ditto.
Stachys.
sylvatica ? Fuegia.
Marrubium. South Africa.
Leonotis. Ditto.
Sideritis. Ditto.
Galeopsis. Ditto.
Teucrium. Ditto.
Ocimum. Ditto.
Acanthus. Ditto.

Primula.
farinosa. Fuegia, etc.
Anagallis. S. Africa, Fuegia.
Statice.
Pinguicula. Fuegia.
Armeria. Ditto.
Plantago.
maritima. Ditto.
Emex. South Africa.
Polygonum.
maritimum. S. Africa, Fuegia.
Passerina. Ditto.
Mercurialis. Ditto.
Urtica.
dioica. Fuegia. (introd.?)
Salix. South Africa, Chili.
Myrica. Ditto.
Alnus. Ditto.
Empetrum.
nigrum. Fuegia, Trist. d'Acun.

Satyrium. South Africa.
Ruscus. Ditto.
Ornithogalum. Ditto.
Anthericum. Ditto.
Hyacinthus. Ditto.
Scilla. Ditto.
Allium. Ditto.
Sparganium.
simplex. New Zealand.
Lemna.
gibba. New Zealand.
Carex.
festiva. Fuegia.
curta. Ditto.
Phleum.
alpinum. Fuegia.
Alopecurus.
alpinus. Fuegia.
Phalaris. South Africa.

Agrostis.
tenuifolia, var. Fuegia.
canina. New Zealand.
Avena. Fuegia.
Aira.
flexuosa. Fuegia.
Poa.
pratensis. Ditto.
nemoralis. Ditto.
Dactylis. Ditto.
Catabrosa. Ditto.
Schismus. South Africa.
Melica. Ditto.
Secale. Ditto.
Triticum.
caninum. Fuegia.
Elymus. Ditto.
Hordeum.
jubatum. Ditto.

This catalogue adds many very northern genera to the southern Flora, chiefly from South Africa, and some very northern species, chiefly from Fuegia and the Antarctic islands; of the latter, the best-marked are the following, with their distribution:—

Anemone *decapetala.* Northern United States and Arctic circle. Peru, Chili, South Brazil.
Draba *incana.* Northern and Arctic Europe and Asia.
Sisymbrium *Sophia.* Europe, North Asia, Caucasus, Himalaya, North America, Fuegia, South Chili.
Lychnis *apetala.** Arctic Europe, Asia, and America, Altai and Himalaya.
Cerastium *arvense.* Europe, Russian Asia, North America.
Lathyrus *maritimus.* Arctic and North-western Europe, Arctic Asia and America.
Hippuris *vulgaris.* Europe, North and Central Asia, North America, and Arctic regions.
Saxifraga *exarata.* Alpine and Arctic Europe, Asia Minor, and North America.
Galium *Aparine.* All Europe, North and Central Asia, Himalaya, North America.
Erigeron *alpinus.* Alpine and Arctic Europe, Asia, and America.
Taraxacum *Dens-leonis.* Temperate and Arctic Europe, Asia, and America.
Gentiana *prostrata.* Alps of Central Europe and Asia, Himalaya, Rocky Mountains, and Andes of South America.
Stachys *sylvatica.*† Europe, North and Central Asia.
Veronica *Anagallis.* Europe, Central and North Asia, North America.
Primula *farinosa.* Northern and Arctic Europe, Asia, America.
Statice *Armeria.* Throughout North Temperate Zone to Arctic regions.
Plantago *maritima.* Europe, North and Central Asia, North and South America, South Africa.
Polygonum *maritimum.* Europe, North Asia, North America.
Empetrum *nigrum.* Northern and Arctic Europe, Asia and America.
Sparganium *simplex.* Northern and Arctic Europe, Asia and America.

* *L. Magellanica*, Lamk., Flor. Antarc., ii. 246.

† *S. Chonotica*, Flor. Antarc., ii. 336.

Carex *festiva*. Arctic North America, and Lapland.
Carex *curta*. Arctic and Alpine Europe, Asia, and North America.
Phleum *alpinum*. Arctic and Alpine Europe, Asia and America.
Alopecurus *alpinus*. Arctic and Alpine Europe, Asia and America.
Agrostis *canina*. Europe, North Asia, North America.
Aira *flexuosa*. Europe, North Asia, North America.
Poa *pratensis*. Temperate and Arctic Europe, Asia, North America.
Poa *nemoralis*. Northern and Arctic and Alpine Europe, Asia, Himalaya, North America.
Triticum *caninum*. Temperate and Arctic Europe and America, Central and Northern Asia.
Hordeum *jubatum*. Temperate North America.

Here are 30 species, of which the *Taraxacum* is found both in New Zealand and Fuegia, and the *Veronica Anagallis* and *Agrostis canina* in New Zealand only. If to this we add 12 from the Australian list of northern forms, which are also found in south Chili, or the Antarctic islands, we have two nearly equal lists of decidedly northern plants in the south temperate and colder zones, —one of the Old World, the other of the New; in which lists about one-third of the plants are common to both. I have no catalogue of the decidedly indigenous European plants in South Africa, and therefore cannot extend this subject by comparing the two south temperate divisions of the Old World Flora in respect of the northern plants they contain; but my impression is that though South Africa adds so many northern genera, it will fall short in number of nearer allied forms.

The last observation I shall make with reference to this subject is, that the existing European Flora does not contain one Australian representative, nor betray the remotest direct botanical affinity with the Australian. I have elsewhere indicated (p. xxi.) that there is evidence of what are now Australian plants having once inhabited Europe. In north-eastern Asia there are however a few Australian forms, of which the *Haloragis, Stylidium,* and *Bæckia* of China, the *Microtis* of Bonin, *Stackhousia* and *Thysanotus?* of Philippine Islands, *Thelymitra* of Java, and *Proteaceæ* of Japan are examples. Connecting these again is the singular assemblage of Australian forms on the lofty mountain Kini Balou in Borneo, and which consists of species of *Drimys, Leptospermum, Leucopogon, Coprosma, Didiscus, Drapetes, Euphrasia, Phyllocladus, Dacrydium,* and an Irideous and Restiaceous plant, both apparently allied to Australian genera.

§ 12.

On the Fossil Flora of Australia, and its Geology in relation to the Existing Flora.

The fossiliferous rocks of Australia do not throw much light upon the antiquity of its existing Flora, because of the hiatus which geologists seem to consider exists between the palæozoic and tertiary strata of that country. Mr. Jukes* has called attention to the curious fact that this deficient series in Australia is largely developed in Europe, and there presents such Australian forms of life as marsupiate quadrupeds, *Trigonia* and other fossil shells, together with Cycadeous plants. To the latter no importance can be attached, as this Order is far more characteristic of tropical America, of India, and even of south-east Africa, than of Australia; but on the other hand the

* J. B. Jukes, 'Physical Structure of Australia,' p. 89, etc.

Araucaria of the English oolite, and other fossils alluded to at p. xxi., would seem to tend to confirm Mr. Jukes's observation.

The so-called Palæozoic rocks of Australia contain fossil plants of which so little, botanically, is known, that it would be rash to speculate on their affinities, even if we knew the age of the beds they are found in, as compared with the European, which we do not. Their fossils comprise Ferns of several genera, including the genus *Glossopteris*, which is found in the oolitic beds of England, and in India;* *Phyllotheca*, a plant somewhat similar to *Casuarina*, but of extremely doubtful affinity; *Vertebraria*, also an Indian fossil, as to the affinities of which no plausible guess has been made; *Sphenopteris* and *Zygophyllites*, of which little more can be said. To these the Rev. W. B. Clarke† adds the following well-known British coal fossils,—*Lepidodendron*, *Halonia*, *Sigillaria*, *Ulodendron*, *Calamites*, and *Stigmaria*.

Many of the tertiary fossil plants of Australia would seem to be very closely allied to existing ones; these include the *Casuarina* cones of Flinders Island, the *Banksia* and *Araucaria* wood of Tasmania, the *Banksia* cones of Victoria (which seem identical with those of *B. ericifolia*, though buried under many feet of trap). The leaves of the calcareous tuffs on the banks of the Derwent,‡ etc., appear however to belong to a different and warmer period.

From the above it would appear that the extinct Flora of Australia was not entirely different from that now existing, and, following Mr. Jukes's line of argument, that Australia continued as dry land during the European Oolitic and Cretaceous periods. At this epoch Mr. Jukes assumes that the peculiar Flora of Australia was introduced, and that the continent was again submerged during the Tertiary epoch, when it presented the appearance of two long islands, or chains of islands, one, the larger, representing the elevated land of eastern Australia and Tasmania, the other that of south-eastern Australia, together with subsidiary groups in the western and northern parts of the continent.

These are the speculations of an able geologist and voyager, which I introduce without comment, and chiefly to observe that such a partition of the continent may be supposed to be favourable to the multiplication of forms of vegetable life out of fewer pre-existing ones, by the segregation of varieties. These groups of islands would present a precise analogy with the Galapagos and Sandwich groups, where we have the small islands of one Archipelago peopled by different species, and even genera. The subsequent elevation of these islets, and consequent union of them into larger ones, would further, according to Darwin's hypothesis (of the struggle of very different kinds of species and families for occupation of the soil resulting in a further separation of varieties into species), tend to enlarge the genera numerically within comparatively small geographical limits, and thus effect such a geographical distribution of plants as Australia now presents.

In our complete ignorance as to the condition of all the continents during the Palæozoic epoch, it is impossible to speculate on the earlier condition of the Australian Flora. That previous to some Tertiary submersion of a great part of the continent, it was not altogether specifically different from what it now is, would appear from a fact insisted on by Mr. Jukes, that it was during such a submersion that those volcanos were active, the lavas of which now cover large tracts of southern Australia, and which we know to have buried a plant apparently identical with *Banksia ericifolia*, which is still one of the commonest trees in that part of the country: but the question of where the *Banksias* and their allies were created, and, if in other lands than Australia, how they migrated thither, we have no

* M'Coy in Ann. Nat. Hist. vol. xx. p. 152. † Journ. Geolog. Soc. Lond. vol. iv. p. 60.

‡ Darwin's Journal, p. 535, and Volcanic Islands, p. 140: Strzelecki, p. 254; Milligan in Tasman. Journ. i. 131.

means of answering. If the identifications of *Banksia* and other Proteaceous leaves in the Cretaceous and Miocene formations of Europe are worthy of any confidence, it is possible that the Australian from the northern to the southern hemisphere, as, according to Darwin's types may have migrated speculations, the existing European plants in Australia have.

Some arguments in favour of the antiquity of the Australian Flora as compared with the European may be derived from a consideration of its generic and ordinal peculiarities. If, as I have expressed it, a Genus or Order is rendered peculiar, that is, unlike its allies, by the extinction of the intermediate species, it follows that the greater the peculiarity the greater the number of lapsed forms. Applying this argument to the Australian Flora, we must assume an extraordinary destruction of species that once linked it with the general Flora of the globe, to account for its many peculiar genera, and these being represented by so many species. But as this destruction of species is primarily due to geological causes, that influence climates and so directly and indirectly lead to the extinction of species, and as geological events are of slow progress, it follows that we must regard the Australian Flora as a very ancient one. Again, Darwin argues that a rich Flora or Fauna, marked by a preponderance of highly developed types, must have required a large area for its development: this is because, according to his view, the principle of natural selection favours the high forms, and is unfavourable to the low. Now it could be easily shown that the Australian Flora is of as high a type as any in the globe, but under existing conditions has a very small area for its development, and presents fewer representatives of other Floras to contend with than most; and we must hence, under these hypotheses, assume not only the antiquity of the Flora, but that it was developed in a much larger area than it now occupies.

The only other geological speculation, founded upon anything like plausible grounds, that bears upon the origin of any of the plants now inhabiting Australia, is that of Mr. Darwin in reference to the European species, to which I have alluded at p. xvii. It implies of course that the existing European types were introduced into the continent long subsequently to the peculiar Australian, and are plants of a later creation. I have already pointed out the difficulties attending its adoption, the chief of which is the admission of such a cold climate in the intertropical latitudes as that not merely a temperate, but a decidedly northern Flora should have migrated across them; and that this migration, if conceded, must have been extensive and have introduced very many genera and species into the tropics appears likely, when we consider the fragmentary character of the assemblage of northern forms still left in Australia,—for even when reduced to its most typical examples, it consists of nearly as many Natural Orders as species. The little colony of south Australian genera found under the Equator, on Kini Balou, in Borneo, presents another difficulty, except indeed it be regarded as evidence of that previous southern migration of Australian forms from Europe to Australia, which I have just mentioned as conceivable.

There are then the Antarctic types to account for; were they of more recent introduction than the European or Australian? Darwin has alluded to the possibility of these having been transported by icebergs from higher southern latitudes, during a period of greater cold than now obtains in the southern hemisphere, (as the Scandinavian and Arctic plants are supposed by Forbes to have been transported to Britain, etc., during the Glacial period), and, with the north European plants already in Australia, to have ascended the mountains during the subsequent rise of temperature. This would imply that Australia was, during a cold Tertiary period, simultaneously peopled by all those Antarctic, European, and Australian types which now inhabit it, but that the latter Flora was much less developed in number of species and genera than now; for I cannot but regard the Antarctic Flora in the same

light as the European, and as a mere fragment of a much more extensive one, whose other members perished in the battle for place waged with the European and Australian during those changes of climate and level that succeeded their first introduction. The ultimate numerical ascendency of the Australian botanical element may have been gained during the subsequent partition of the continent into archipelagos of islands, which became so many colonies of Australian types of vegetation, prepared on the final rise of the land to descend and occupy the intermediate ground. The paucity of alpine plants of Australian genera is a fact which lends itself well to this idea; it implies that, during either the rise of land or increase of temperature, the tendency of the species of Australian type was to seek warmer regions, and that the boreal and antarctic types being better suited to a colder climate prevented to a great extent the establishment of such varieties of Australian type as might otherwise have been adapted to inhabit the same climate as themselves.

When I take a comprehensive view of the vegetation of the Old World, I am struck with the appearance it presents of there being a continuous current of vegetation (if I may so fancifully express myself) from Scandinavia to Tasmania; along, in short, the whole extent of that arc of the terrestrial sphere which presents the greatest continuity of land. In the first place, Scandinavian genera, and even species, reappear everywhere from Lapland and Iceland to the tops of the Tasmanian alps, in rapidly diminishing numbers it is true, but in vigorous development throughout. They abound on the Alps and Pyrenees, pass on to the Caucasus and Himalaya, thence they extend along the Khasia mountains, and those of the peninsulas of India to those of Ceylon and the Malayan archipelago (Java and Borneo), and after a hiatus of 30°, they appear on the alps of New South Wales, Victoria, and Tasmania, and beyond these again on those of New Zealand and the Antarctic Islands, many of the species remaining unchanged throughout! It matters not what the vegetation of the bases and flanks of these mountains may be; the northern species may be associated with alpine forms of Germanic, Siberian, Oriental, Chinese, American, Malayan, and finally Australian and Antarctic types; but whereas these are all, more or less, local assemblages, the Scandinavian asserts his prerogative of ubiquity from Britain to beyond its antipodes.

Next in importance and appearance along the arc indicated is that Flora which may be called Himalayan,* and which consists of the endemic plants of that range, with a mixture of Siberian, Caucasian, and Chinese genera; this, gathering strength in its progress south-eastward along the ranges of northern and eastern India, occupies the flanks of all the mountain-chains I have enumerated between the Caucasus and Malay Islands; but there the Himalayan Flora disappears, and does not reappear in Australia or New Zealand, and scarcely a trace of it is found in Polynesia.

The Malayan Flora† is in many respects closely allied to the Himalayan, but is wholly tropical in character. This also very gradually appears in the valleys of the western and central Himalaya, and multiplying in genera and species in the eastern Himalaya and Khasia ranges, it sweeps down the Malayan peninsula, occupies all the Malayan Islands, and then it too stops short without entering Australia, being, however, continued eastward in tropical Polynesia.

Lastly, there is the Flora of the plains and lower hills of India,‡ which is of a drier character than the Malayan, and is equally characteristic of Africa. This commences gradually in north-west India, or even in eastern Persia, and occupies all central India, the Gangetic plain, the whole of the

* Characterized by *Cupuliferæ*, *Magnoliaceæ*, *Ternstræmiaceæ*, *Laurineæ*, *Balsamineæ*, *Ericeæ*, *Fumariaceæ*, etc.

† *Vaccineæ*, *Rhododendron*, *Begoniaceæ*, *Quercus*: and equally typified by *Cyrtandraceæ*, *Dipterocarpeæ*, *Myristiceæ*, *Anonaceæ*, *Menispermeæ*.

‡ It consists of *Acanthaceæ*, *Sterculiaceæ*, and other Orders, enumerated at p. xlii. *et seq.*

Madras peninsula, except the western coast and mountains, the valley of the Irrawaddi, and the lower flat districts of the Malay Islands, whence it is continued in great force over the whole of tropical Australia.

Reversing the position, and beginning at the southern extreme of this arc of vegetation, there is first the Antarctic Flora (the complement of the Scandinavian), with its decided Australian representatives in *Centrolepideæ* and *Stylidieæ*, commencing in Fuegia, the Falklands, and Lord Auckland's and Campbell's group, reappearing in the alps of New Zealand, Tasmania, and Australia, and disappearing under the equator, on the alps of Borneo, being thus strictly confined to the southern hemisphere. Next there is the Australian Flora proper, a large and highly developed one, diminishing rapidly after crossing the southern tropic, and as it advances towards the north-western shore of the continent, reappearing in very small numbers in the Malay Islands, and terminated by a *Casuarina* on the east coast of the Bay of Bengal, and a *Stylidium* on the west. Not one representative of this vegetation advances further north-west.

Analogous appearances are presented by Africa and America. In Africa Indian forms prevail throughout the tropics, and, passing southwards, occupy the northern boundary of the south temperate zone; but there a very copious and widely different vegetation succeeds, of which but few representatives advance north to the tropic, and none to India, but with which are mingled Scandinavian genera and even species. In the New World, Arctic, Scandinavian, and North American genera and species are continuously extended from the north to the south temperate and even Antarctic zones; but scarcely one Antarctic species, or even* genus (*Forstera, Calceolaria, Colobanthus, Gunnera,* etc. etc.) advances north beyond the Gulf of Mexico.

These considerations quite preclude my entertaining the idea that the Southern and Northern Floras have had common origin within comparatively modern geological epochs; on the contrary, the European and Australian Floras seem to me to be essentially distinct, and not united by those of intervening countries, though fragments of the former are associated with the latter in the southern hemisphere. For instance, I regard the Indian plants in Australia to be as foreign to it, botanically, as the Scandinavian, and more so than the Antarctic; and that to whatever lengths the theory of variation may be carried, we cannot by it speculate on the Southern Flora being directly a derivative one from the existing Northern. On the contrary, the many bonds of affinity between the three southern Floras, the Antarctic, Australian, and South African, indicate that these may all have been members of one great vegetation, which may once have covered as large a southern area as the European now does a Northern. It is true that at some anterior time these two Floras may have had a common origin, but the period of their divergence antedates the creation of the principal existing generic forms of each. To what portion of the globe the maximum development of this Southern Flora is to be assigned, it is vain at present to speculate; but the geographical changes that have resulted in its dismemberment into isolated groups scattered over the Southern Ocean, must have been great indeed. Circumscribed as these Floras are, and encroached upon everywhere by northern forms, their ultimate destiny must depend on that power of appropriation in the strife for place which we see in the force with which an intrusive foreign weed establishes itself in our already fully peopled fields and meadows, and of the real nature of which power no conception has been formed by naturalists, and which has not even a name in the language of biology. Everywhere, however, we see the more widely distributed, and therefore least peculiar forms of plants, spreading, and the most peculiar dying out in small areas, and the progress of civilization has introduced in man a new enemy to

* *Acæna* is a remarkable exception. See p. xc. in note.

the scarce old forms, and a strong ally of those already common: nor can it be doubted but that many of the small local genera of Australia, New Zealand, and South Africa, will ultimately disappear, owing to the usurping tendencies of the emigrant plants of the northern hemisphere, energetically supported as they are by the artificial aids that the northern races of man afford them.

§ 14.

On some of the Naturalized Plants of Australia.

My sources of information upon this subject are unfortunately extremely scanty, and almost confined to data procured from the vicinity of Melbourne, where Mr. Adamson has paid especial attention to the introduced species which have run wild, and assumed the positions and importance of native plants. It would be interesting to discover the date and particular circumstances under which these plants were introduced, and so to register their increase and migrations as to afford to succeeding observers the means of comparing their future condition with their present. In the early times of a colony, there is comparatively little difficulty in distinguishing the colonists from the native species; but as the surface of the land becomes artificially disturbed, the habits of all its plants are influenced,—the endemic species are driven from their native places, and take refuge in hedgerows, ditches, and planted copses, and from there associating with the introduced plants, are apt to be classed in the same category with them; whilst the introduced wander from the cultivated spots and eject the native, or, taking their places by them, appear, like them, to be truly indigenous.

There are many interesting subjects of inquiry connected with this replacement of one vegetable by another, such as determining the relations between the facility with which the new plants of certain countries or genera are introduced and establish themselves, and the countries such plants come from, or Floras of which they form a part.* Much of course depends on the new comer finding a suitable climate and soil for its future increase, but there may be more in the physique or constitution of the new comer that enables it to displace other plants which are apparently equally well (if not better) adapted to the circumstances it finds itself environed with. The nature of the past intercourse between Europe and Australia should lead us to anticipate that a far greater number of English plants are naturalized in Australia than of Australian in England; but the fact of importation does not explain naturalization, nor how it is that no Australian plant has become naturalized in England. This total want of reciprocity in migration is no doubt mainly attributable to climate, but then we have the apparent double anomaly, that Australia is better suited to some English plants than England is, and that some English plants are better suited to Australia than those Australian plants were which have given way before English intruders. For my own part, I am disposed to consider that the three elements of (1) abundant exportation of seed from Europe into Australia for agricultural and horticultural purposes, and scanty export of Australian seed produce to England; (2) better adaptation of Australia than England to support numerous forms of vegetable life; and (3) abundance of unoccupied ground in Australia as compared with England; are, combined, all but sufficient to account for the predominance of so many European naturalized plants in Australia, and for the converse state of things in England. But I think it may still remain to be seen whether the altered

* The reader will find some admirable discussions on this and kindred subjects in the chapters of A. De Candolle's 'Géographie Botanique Raisonnée' devoted to naturalized and introduced plants.

circumstances which seem to be temporarily favourable will prove to be so permanently: perhaps they over-stimulate, and will, by gradually effecting a change on the constitution of the naturalized plants, either render them eventually distinct forms, or bring on degeneracy and consequent extinction.

In all these discussions it must be borne in mind that no wild species is stationary in number of individuals. None will survive all time; each must reach a period of maximum development, and decline from it to extinction; and as we do not know that man can add to or take from the sum of vegetable matter on the globe, it may very well be the case, that in every instance where his operations tend to an inordinate development of a species in individuals, he is shortening the period of time otherwise allotted for the duration of that species. Man, as I have observed before (p. viii. in note), may hasten or retard the operations of Nature, but cannot reverse them.

The following list refers almost entirely to Melbourne, a colony established about twenty years ago. I have no such list of the introduced plants of any other Australian colony, and the scattered notices of naturalized plants that I have met with in various travels, are not sufficiently definite to be quoted. Thus, in Mitchell's first journey, I find a singular observation, that Horehound and common Grass, or Dog-tooth Grass, spring up wherever the white man sets his foot, by which I assume that the *Marrubium* and *Cynodon* are meant, but cannot be sure.

Catalogue of some of the Naturalized Plants of the Australian Colonies, (chiefly compiled from the Melbourne collections and notes of F. Adamson, Esq.,) to which are added the species enumerated in Mueller's Reports, and Backhouse's and Gunn's MSS.

The letter A indicates that the species is also naturalized in the northern United States, according to Professor Asa Gray's Manual.

A 1. Ranunculus *acris*, L. Very common at Melbourne. (Britain, pastures.)
A 2. Ranunculus *sceleratus*, L. Victoria. (Britain, pastures, ditches.)
A 3. Ranunculus *muricatus*, L. Victoria. (Europe, cornfields.)
A 4. Delphinium *Consolida*, L. New South Wales. (Europe, cornfields.)
5. Papaver *album*, L. New South Wales. (Europe.)
A 6. Papaver *dubium*, L. New South Wales. (Britain.)
7. Escholtzia *Californica*, Cham. Victoria. (California.)
A 8. Argemone *Mexicana*, L. New South Wales. (South United States.)
A 9. Fumaria *officinalis*, L. (Britain, waste places.)
A 10. Barbarea *præcox*, L. An overpowering weed in Tasmania, *Backh.* (Britain, hedges, etc.)
A 11. Nasturtium *officinale*, L. (Britain, water plant.)
A 12. Sisymbrium *officinale*, L. Victoria. (Britain, roadsides.)
A 13. Capsella *Bursa-pastoris*, L. Ubiquitous. (Britain, waste places.)
14. Lepidum *sativum*, L. New South Wales. (South Europe.)
A 15. Lepidum *ruderale*, L. Victoria. (Britain, waste places.)
A 16. Senebiera *didyma*, Pers. Victoria, Tasmania. (Britain, waste places.)
A 17. Raphanus *Raphanistrum*, L. Victoria. Sometimes colouring the cornfields pink, *Adamson*. (Britain, weed of culture.)
A 18. Brassica *Napus*, L. Tasmania. (Britain, weed of culture.)
A 19. Sinapis *arvensis*, L. Tasmania. (Britain, weed of culture.)
20. Malva *pusilla*, With. Grows to a great size (2 feet) in cultivated ground, looking very different from its usual small state. Victoria, *Adamson*. (Europe.)
A 21. Malva *sylvestris*, L. Victoria and Tasmania. (Britain, roadsides.)

A 22. Malva *crispa*, L. Victoria. (Central Europe, fields and waste places.)
A 23. Malva *rotundifolia*, L. Tasmania. (Britain, fields and waste places.)
24. Silene *Gallica*, L. Victoria. (South Europe, weed of cultivation.) Var. *quinquevulnera*. Victoria and Tasmania. (South Europe, weed of cultivation.)
25. Cerastium *glomeratum*. Victoria. (Britain, waste places.)
A 26. Cerastium *vulgatum*, L. Victoria and Tasmania. (Britain, waste places.)
A 27. Sagina *apetala*, L. Victoria. (Britain, waste places.)
A 28. Stellaria *media*, L. Ubiquitous. (Britain, weed of cultivation.)
A 29. Spergula *arvensis*, L. Ubiquitous. (Britain, weed of cultivation.)
A 30. Linum *usitatissimum*, L.? Sparingly, and never far from cultivated ground, *Adamson*. (Britain, weed of cultivation.)
A 31. Erodium *cicutarium*, L. Tasmania. (Britain, waste places.)
32. Erodium *moschatum*, L. Adamson considers this to be decidedly indigenous on sandhills near the sea, whence it has spread to cultivated grounds, assuming a very large size and different form. Mueller notes it as an introduced plant. (Britain, waste places.)
33. Geranium *molle*, L. Tasmania. (Britain, pastures.)
A 34. Melilotus *officinalis*, L. (Britain, waste places.)
A 35. Melilotus *alba*, Lam. (Britain, waste places.)
36. Lathyrus *odoratus*, L. (South Europe, garden plant.)
37. Lathyrus *latifolius*, L. (South Europe, garden plant.)
A 38. Trifolium *repens*, L., has spread most luxuriantly wherever there is moisture, often destroying all other vegetation. (Britain, pastures.)
A 39. Trifolium *pratense*, L. Tasmania. (Britain, pastures.)
A 40. Trifolium *procumbens*, L. (Britain, pastures.)
41. Trifolium *filiforme*, L. (Britain, waste places.)
A 42. Medicago *sativa*, L. (South Europe, waste places.)
A 43. Medicago *lupulina*, L. New South Wales. (Britain, waste places.)
44. Lotus *tenuifolius*, Presl. Victoria. (South Europe, fields and hedges.)
45. Lotus *corniculatus*, L. Victoria. (Britain, fields and hedges.)
46. Vicia *angustifolia*, Roth. (Germany, fields and hedges.)
A 47. Vicia *sativa*, L. New South Wales. (Britain, fields.)
A 48. Ervum *hirsutum*, L. (Britain, fields.)
49. Lupinus *polyphyllus*, Dougl. New South Wales. (California, garden plant.)
50. Psoralia *pinnata*, L. Swan River. (Cape of Good Hope.)
51. Ulex *Europæus*, L. Naturalized about Hobarton, *Backh.* (Britain. Naturalized in St. Helena and Nilgherry mountains.)
52. Amygdalus *Persica*, L. New South Wales. (Persia.)
A 53. Rosa *rubiginosa*, L. Forms thickets in Tasmania; also common in Victoria. (Britain.)
A 54. Alchemilla *arvensis*, Lam. (Britain, weed of cultivation.)
55. Poterium *Sanguisorba*, L. (Britain.)
A 56. Lythrum *hyssopifolium*, L. In the streets of Sydney. (South Europe.)
57. Œnothera *suaveolens*, Desf. (North America.)
58. Polycarpon *tetraphyllum*, L. Ubiquitous. (South Europe.)
A 59. Portulaca *oleracea*, L. Victoria, New South Wales. (Tropics.)
60. Fœniculum *vulgare*, L. Victoria, New South Wales. (South Europe, garden plant.)
A 61. Pastinaca *sativa*, L. Victoria. (Britain, fields.)
62. Sherardia *arvensis*, L. Tasmania. (Britain, fields and waste places.)

63. Scabiosa *atro-purpurea*, L. Thoroughly established at Melbourne, *Adamson*. (South Europe, garden plant.)
64. Bellis *perennis*, L. Tasmania, in old gardens only. (Britain.)
65. Conyza *ambigua*, DC. (Europe, fields and waste places.)
66. Erigeron *Canadensis*, L. Ubiquitous. (United States.)
67. Bidens *tripartita*, L. (Britain.)
68. Chrysanthemum *segetum*, L. (Britain, weed of culture.)
69. Siegesbeckia *orientalis*, L. Ubiquitous weed of tropics. (India.)
70. Eclipta *erecta*, L. Ubiquitous weed of tropics. (India.)
71. Galinsoga *parviflora*, Cav. New South Wales. (South America.)
72. Pyrethrum *inodorum*, L. Tasmania. (Britain, weed of cultivation.)

A 73. Anthemis *Cotula*, L. Victoria. (Britain, weed of cultivation.)

74. Gnaphalium *luteo-album*, L. Forms a dense crop on newly turned-up land, to the exclusion of everything else. (Ubiquitous.)
75. Cryptostemma *calendulaceum*, Br. Abundant at Perth, *Harvey*. (South Africa.)
76. Carthamus *tinctorius*, L. (India, cult.)

A 77. Onopordon *Acanthium*, L. (South Europe, cult.)

A 78. Cnicus *lanceolatus*, L. Found at Melbourne, but has not spread much, *Adams*. A pest in Tasmania. (Britain, fields and roadsides.)

A 79. Cnicus *arvensis*, Hoffm. Also a pest in Tasmania. (Britain, fields and roadsides.)

80. Cnicus *palustris*, Willd. Common in Tasmania. (Britain, meadows, etc.)
81. Carduus *Marianus*, L., has spread amazingly along the great road up-country, and at Melbourne, preferring the richest soils, *Adams*. Also a pest in Tasmania, *Harvey*. (South Europe.)
82. Cynara *Scolymus*, L. (South Europe.)

A 83. Centaurea *solstitialis*, L. Victoria. Very abundant in certain places, but never far from cultivation, *Adams*. (South Europe, fields and waste places.)

84. Tragopogon *porrifolium*, L. Victoria. (South Europe, fields and waste places.)
85. Lapsana *pusilla*, L. So thoroughly introduced into Tasmania as to be apparently indigenous, *Gunn*. (Britain, fields.)
86. Hypochœris *glabra*, L. Victoria, Tasmania. (Britain, fields.)

A 87. Taraxacum *Dens-leonis*, Desf. Victoria, common. (Britain, ubiquitous in cultivated ground, etc.)

A 88. Sonchus *asper*, Vill. Victoria, Tasmania. (Britain, ubiquitous in cultivated ground, etc.)

A 89. Sonchus *oleraceus*, L. Growing everywhere, even on the roofs of houses in Melbourne, *Adamson*. (Britain, ubiquitous in cultivated ground, etc.)

A 90. Sonchus *arvensis*, L. (Britain, ubiquitous in cultivated ground, etc.)

A 91. Apargia *autumnalis*, Willd. (Britain, ubiquitous in cultivated ground, etc.)

A 92. Xanthium *spinosum*, L. First observed in April, 1857, in isolated patches near Melbourne. I am informed that it also first appeared in great quantities in the present year, at Queenscliff, near the Heads, *Adamson*.

93. Gorteriæ species? Spreading with great rapidity around Melbourne; growing 2–3 feet high, and destroying all other vegetation. Fortunately cattle are very fond of it, *Adamson*. (Cape of Good Hope.)

A 94. Melissa *officinalis*, L. (South Europe, hedges, etc.)

A 95. Origanum *vulgare*, L. (Britain, hedges and waste places.)

A 96. Marrubium *vulgare*, L. (Britain, fields and roadsides.)

A 97. Stachys *arvensis*, L. (Britain, fields and roadsides.)
98. Echium *violaceum*, L. New South Wales. (South Europe, waste places.)
A 99. Lithospermum *arvense*, L. Tasmania. (Britain, weed of culture.)
A 100. Echinospermum *Lappula*, Sw. (South Europe.)
101. Verbena *Bonariensis*, L. New South Wales. (South America.)
102. Solanum *Sodomæum*, L. (South Europe.)
A 103. Datura *Tatula*, L. (South Europe.)
A 104. Verbascum *Blattaria*, L. (Britain, waste places.)
105. Verbascum *virgatum*, With. (Britain.)
106. Celsia *Cretica*, L. (South Europe.)
A 107. Veronica *peregrina*, L. (South Europe.)
A 108. Veronica *serpyllifolia*, L. (Britain, fields and waste places.)
A 109. Anagallis *arvensis*, L. Common on cultivated ground, and has also spread into native pastures, *Adamson*. (Britain, weed of cultivation.)
A 110. Plantago *major*, L. (Britain, weed of cultivation.)
A 111. Plantago *lanceolata*, L. (Britain, weed of cultivation.)
112. Plantago *Coronopus*, L. Tasmania. (Britain, generally maritime.)
A 113. Polygonum *Convolvulus*, L. Victoria, Tasmania. (Britain, weed of cultivation.)
A 114. Polygonum *aviculare*, L. Very abundant about Victoria. I have seen newly turned-up soil covered with a thick matting of it. Cattle eat it with avidity, *Adamson*. (Britain, weed of cultivation.)
A 115. Rumex *Acetosella*, L. This often monopolizes the pastures about Melbourne, to the entire exclusion of the Grasses, *Adamson*. (Britain, weed of cultivation.)
A 116. Rumex *crispus*, L. (Britain, weed of cultivation.)
A 117. Urtica *dioica*, L. Only seen at Melbourne where houses are or have been, *Adamson*. (Britain, chiefly near houses.)
A 118. Urtica *urens*, L. (Britain, chiefly near houses.)
A 119. Chenopodium *viride*, L. Tasmania. (Britain, chiefly near houses.)
120. Atriplex patula, L. (Britain, chiefly maritime.)
A 121. Euphorbia *helioscopia*, L. (Britain, weed of cultivation.)
A 122. Alopecurus *geniculatus*, L. (Britain, weed of cultivation.)
A 123. Anthoxanthum *odoratum*, L. (Britain, weed of cultivation.)
124. Phalaris *minor*, Retz. (South Europe, weed.)
A 125. Phalaris *Canariensis*, L. (South Europe, weed.)
A 126. Holcus *lanatus*, L. (Britain, weed.)
A 127. Polypogon *Monspeliensis*, Desf. (South Europe, waste places.)
128. Avena *fatua*, L. (Britain, weed of cultivation.)
A 129. Dactylis *glomerata*, L. (Britain, fields and waste places.)
A 130. Poa *annua*, L. Ubiquitous. (Britain, weed of cultivation.)
A 131. Briza *media*, L. Victoria, Tasmania. (Britain, weed of cultivation.)
132. Briza *minor*, L. (Britain, weed of cultivation.)
133. Festuca *Myurus*, L. Ubiquitous. (Britain, weed of cultivation.)
A 134. Bromus *sterilis*, L. Victoria. (Britain, weed of cultivation.)
A 135. Bromus *commutatus*, L. Victoria. (Britain, weed of cultivation.)
A 136. Lolium *perenne*, L. Victoria, Tasmania. (Britain, weed of cultivation.)
A 137. Lolium *temulentum*, L. Victoria. (Britain, weed of cultivation.)
138. Hordeum *murinum*, L. Victoria. (Britain, roadsides.)
139. Lepturus *incurvatus*, L. Victoria, Swan River. (Britain, salt-marsh.)

§ 15.

A List of some of the Esculent Plants of Australia.

In the course of reading preparatory to undertaking this Essay, I found scattered notices of edible and other plants, which I thought might be worth bringing together, and thus form the skeleton of an Australian 'Flora Cibaria,' for the use of future inquirers. It is extremely incomplete as an exposition of the uses to man of the Australian Flora, both because it omits many plants that have escaped my notice or memory, more that I know nothing of, and perhaps a still greater number that come under the category of being "eatable but not worth eating." I have not alluded to pharmaceutical plants: such may exist, and multitudes of the weeds, seeds, and roots of Australia will no doubt enjoy a more or less substantial reputation as drugs, for a period, and then be consigned to oblivion. This is the pharmaceutical history of the plants of all countries that have been long inhabited by civilized man, and Australia will form no exception to them. The fact being, that of the multitude of names of plants that appear in Pharmacopœias, the number of really active and useful plants, known to be such, is extremely small.

I have been greatly indebted to Backhouse's Notes on the Edible Plants of Tasmania (Ross, 'Hobarton Almanack'), and to Gunn's and Mueller's various writings, for much of the following information.

Atherosperma moschata. Bark used as tea in Tasmania.
Tasmania aromatica. "Pepper-tree." Drupe used as condiment.
Cardamine hirsuta. This and other species afford excellent pot-herbs when luxuriant and flaccid.
Nasturtium terrestre. Ditto.
Nymphæa gigantea, and another species. Roots and fruit eaten.
Nelumbium speciosum. Seeds eaten raw, and roasted as coffee.
Hibiscus, allied to heterophyllus? Yields a sorrel.
Billardiera mutabilis. Berries acid and pleasant.
Pittosporum acacioides. Yields an excellent gum.
Vitis sp. Tubers and fruits eaten.
Meliaceæ. Various species of *Trichilia?* bear acidulous drupes.
Wallrothiæ sp. Fruit edible.
Triphasia glauca. A small lemon, *Mueller*.
Oxalidis sp. Leaves acid (sorrel).
Geranii spp. parviflorum, and others. Roots eaten by Natives.
Adansonia Gregorii. Dry, acidulous pulp of fruit eaten.
Bombax. Wood used for boats.
Brachychiton sp. Wood full of mucilage; seeds eatable, and make a good beverage.
Coræa alba. Cape Barren Tea.
Castanospermum edule. Moreton Bay Chesnut.
Acacia. Various species yield excellent eating gum, as *A. mollissima*, of which the gum is soft and sweet.
Acacia Sophoræ. Seeds eaten by natives of Tasmania. "Boobyalla."
Acacia pendula. Myall, cattle are fed on its leaves, *Mitchell*.
Erythrina. Wood used for shields and boats.
Canavalia Baueriana. The Mackenzie Bean.

Trigonella suavissima. Excellent spinach, *Mitchell.*
Rubus Gunnianus. The best native fruit in Tasmania.
Parinarium. The Nonda fruit of Leichardt, *Mueller.*
Terminalia. Fruit eaten; gum also eaten.
Jambosa eucalyptoides? Rose-apple.
Leptospermum. Leaves of various species used for tea.
Eugeniæ sp. White apple of tropics, East Australia.
Eucalyptus dumosa, and others? Water contained in roots: native name, "Weir-mallee." Also yields a kind of manna, called Lerp, or Laap (the nidus of an insect), consisting of starch.
Eucalyptus mannifera. Manna formed on leaves.
Eucalyptus Gunnii. Cider-tree of Tasmania.
Portulaca oleracea. Purslane; acidulous pot-herb.
Nitraria Billardieri. Fruit eatable, *Mueller.*
Tetragonia expansa. New Zealand spinach.
Mesembryanthemum præcox. Fruit eatable, *Mueller.*
Mesembryanthemum æquilaterale. "Pigs'-faces." Fleshy fruit eaten. "Canajong" of natives of Tasmania.
Sambucus Gaudichaudiana. Fruit fleshy, sweetish.
Cucumis pubescens. Fruit abundantly eaten.
Lagenaria vulgaris? Gourds used for bottles, etc.
Rhizophora?, Kandelia, etc. Wood used for canoes; young shoots beaten into a paste and eaten.
Gardenia edulis. Leichardt's "Bread-tree," *Mueller.*
Coprosma hirtella. Fruit sweet, eatable, not agreeable.
Coprosma microphylla and C. nitida. Native currant; fruit good.
Sonchus asper. Stems and roots eaten.
Microseris. Roots used roasted by the Natives.
Mimusops Kauki. Fruit eatable.
Maba laurina. Green, palm-like fruit, *Kennedy.*
Gaultheria hispida. "Wax-cluster." Fruit eatable.
Gaultheriæ antipodæ var. Fruit of superior flavour, *Gunn.*
Lissanthe sapida. Fruit eatable.
Astroloma humifusa. "Tasmanian Cranberry." Fruit with a viscid apple-flavoured pulp.
Styphelia ascendens. Fruit eatable.
Leucopogon Richei, and others. Fruit eatable.
Physalis parviflora. Berries eatable.
Solanum vescum. Berries eatable and good. "Gunyang."
Solanum laciniatum. "Kangaroo-apple." A mealy, subacid fruit.
Polygonum adpressum. "Macquarrie Harbour Vine." Fruit subacid, used for tarts and preserves; leaves taste of sorrel.
Boerhaavia acuminata. Root eaten.
Leptomeria acerba, L. pungens, L. acida, and L. Billardieri. Berries eaten; native currant.
Santalum oblongatum. Fruit eaten, *Leichardt.*
Santalum persicarium. Root-bark used as food.
Santalum lanceolatum. Fruit eatable and agreeable, *Mueller.*
Fusanus acuminatus. "Quandong."
Exocarpus. Fruit of various species edible.
Atriplex Halimus. Once used as a pot-herb in New South Wales, and called "Botany Bay Greens"

Chenopodium erosum. A pot-herb. "Australian Spinach."
Rhagodia parabolica. Yields one-third its weight in salt, *Mitchell*.
Salicornia Indica. Young shoots pickled.
Ficus sp.? The "Clustered Fig." Eaten.
Morus Calcar-galli. Mulberry.
A species of *Casuarina?* is the Malleè Oak, which contains water in the cavities of the trunk.
Casuarinæ sp. Native throwing-stick made of its wood. Shoots of *C. quadrivalvis* acid.
Araucaria Bidwillii. "Bunyabunya." Seeds eaten.
Zamiæ sp. Seeds of various species eaten.
Cymbidium canaliculatum. Mucilaginous stems, etc., eaten.
Caladenia and various other Orchids have edible tubers.
Gastrodia sesamoides. Roots cooked and eaten by the Tasmanian natives.
Livistona inermis. "Palm Cabbage."
Livistona australis. "Palm Cabbage," *Leichardt*. Leaves used for baskets.
Arecæ sp. Used for baskets.
Seaforthiæ sp. Leaves used for water-baskets.
Pandanus spiralis, P. aquaticus. Mucilaginous young parts and kernels of fruit eaten.
Typha latifolia. Root an excellent food. (The pollen is made into cakes in New Zealand and Scinde.)
Caladium macrorhizon. Cultivated; root eaten.
Taccæ spp. Tubers eaten, full of starch.
Aponogeton sp. Ditto.
Dioscoreæ spp. Tubers of a wild yam eaten.
Hæmodori spp. Roots eaten.
Philydrum lanuginosum. Leaves used for women's girdles.
Flagellaria Indica. Used for cordage.
Astelia alpina. Fruit sweet, and base of leaves eaten.
Xanthorrhœæ sp. Bases of young leaves eaten raw and roasted.
Xerotes sp. Leaves used for basket-work.
Anthistiria australis. The best fodder-grass of Australia.
Panicum lævinode. Grains pounded yield excellent food.
Avena? Wild Oats. Grain excellent, *Grey*.
Oryza sativa. The Rice was found by Mueller in tropical Australia.
Pteris aquilina, var. esculenta. Root eaten raw and roasted.
Dicksonia antarctica. Pulp of top of trunk full of starch, eaten raw and roasted.
Alsophila australis. Ditto.
Agaricus campestris. Common Mushroom.
Mylitta australis. The native bread (a huge Truffle) of Tasmania.
Cyttaria Gunnii. An edible Fungus, on the branches of *Fagus Cunninghamii*.

§ 16.

Outlines of the Progress of Botanical Discovery in Australia.

In the following rapid sketch of the labours of those who have mainly contributed to develop the botanical riches of Australia, I have endeavoured to give some idea of the comparative amount

and value of the results of the various explorers and collectors, to indicate the extent of coast and interior wholly or partially explored, and to enumerate the narratives and other works which will be found to contain the most botanical information.

I have arranged the subject-matter under four heads.

1. Voyages of Discovery and Survey, undertaken by the English, French, and American Governments.

2. Land Expeditions undertaken by order of the Home or Colonial Governments.

3. Colonial Botanists and Botanical Gardens.

4. Botanical explorers who have worked chiefly on their own or other private resources.

In a few cases I have had to depart from this arrangement, some of the most distinguished Australian explorers having served in several capacities. Thus Allan Cunningham filled the appointments of His Majesty's Botanist in Australia, Colonial Botanist of New South Wales, Botanist to Captain King's voyages, and has also been the leader of several inland exploratory journeys. Dr. Mueller has also distinguished himself in several scientific capacities, and, for extent and range of his journeys, ranks second to Allan Cunningham alone of all Australian botanical explorers.

I. VOYAGES OF DISCOVERY AND SURVEY.

For the first glimmerings of light upon the vegetation of Australia, we are indebted to the great buccaneer and navigator Dampier, who in 1688 visited Cygnet Bay, on the north-west coast of the Continent; and in 1699 he returned to the west and north-west coasts in H.M.S. 'Roebuck' (King's Voy., 1. xxi). The herbarium of Dampier is still preserved at Oxford, and (as I am informed by Mr. Baxter, Curator of the Oxford Botanic Gardens) contains forty specimens, eighteen of which are figured in his 'Voyage,' published in 1703.

The first botanical investigators of any part of Australia were Mr., afterwards Sir Joseph Banks, and his companion, Dr. Solander, the Naturalists of Captain Cook's first voyage. Cook's ship the 'Endeavour' anchored in April, 1770, in Botany Bay, so called by its discoverers from the number and variety of the plants collected by the naturalists during their week's stay there. Proceeding thence northward they landed successively in Bustard Bay, lat. 24° 4′, Thirsty Sound, Point Hillock, and Cape Grafton, lat. 16° 57′, beyond which point the 'Endeavour' struck on a reef, and after incurring imminent peril, she was brought to the Endeavour River, lat. 15° 26′, on the 18th June, 1770. There it was found that the herbarium had suffered from the immersion of the ship, but the greater part was eventually preserved. The 'Endeavour' subsequently visited Cape Flattery, Lizard Island, Weymouth Bay (12° 42′ S.), Possession Island, the northern extreme of Australia and Wallis's Islands.

The plants of Cook's first voyage formed part of the famous Banksian herbarium, which, after the death of its possessor, passed to the British Museum. Of the Australian plants, consisting of nearly 1,000 species, a portion only have been published in Brown's 'Prodromus Floræ Novæ-Hollandiæ.'

Captain Cook, on his second voyage, was accompanied by J. R. Forster and his son George, who made many discoveries in the Pacific islands, Fuegia, and New Zealand, but only one of his ships, the 'Adventure,' commanded by Captain Furneaux, visited any part of Australia, arriving at Adventure Bay, Tasmania, in February, 1773.

In Cook's third voyage, Adventure Bay was again visited, in January, 1777, and a considerable collection made by Mr. David Nelson, and Mr. Anderson, the surgeon of the 'Resolution,' which are preserved in the Banksian herbarium.

In 1791, Captain Vancouver's expedition, consisting of two ships, the 'Discovery' and 'Chatham,' when on their voyage to north-west America, discovered King George's Sound. The expedition was accompanied by Mr. A. Menzies, a zealous botanist, who formed a good collection at this port, some of the plants of which appear in Brown's 'Prodromus.'

In 1801, Captain Flinders's voyage, undertaken to complete the discovery of Terra Australis, was commenced: and it was continued during the two succeeding years in the 'Investigator,' 'Porpoise,' and 'Cumberland.' Owing to the late Robert Brown having accompanied this voyage, it proved, as far as botany is concerned, the most important in its results ever undertaken, and hence marks an epoch in the history of that science. Brown united a thorough knowledge of the botany of his day, with excellent powers of observation, consummate sagacity, an unerring memory, and indefatigable zeal and industry as a collector and investigator; he had further the advantage of being accompanied by a botanical draughtsman, Ferdinand Bauer, who proved no less distinguished as a microscopic observer than as an artist; and he had a gardener, Mr. Peter Good, to assist in the manual operations of collecting and preserving. Hence, when we regard the interest and novelty of the field of research, the rare combination of qualities in the botanist, and the advantages and facilities which he enjoyed, we can easily understand why the botanical results should have been so incomparably greater, not merely than those of any previous voyage, but than those of all similar voyages put together. The 'Investigator' reached King George's Sound in 1802, where Brown collected 500 species, and afterwards coasted along through Bass's Straits to Port Jackson. In July, 1802, the northern survey was commenced, and that of the Gulf of Carpentaria, where the rotten state of the ship obliged her captain to run to Timor, whence they returned by the west and south coast again to Port Jackson. The 'Investigator' was here condemned, and Captain Flinders hired another ship to sail for England, in which he took the duplicates of Brown's collections. Unfortunately this vessel was wrecked on the Cato Reef, in lat. 23° S., but the Captain, and eventually the whole crew, reached Port Jackson: the duplicate collections were of course lost. Brown and Bauer had meanwhile been left in New South Wales, where they explored the Blue Mountains; and Brown also visited the islands of Bass's Straits and Tasmania, where he resided for some months, at Risdon, on the Derwent.

Brown and Bauer finally returned to England in the 'Investigator,' arriving in 1805 with a complete set of all their collections. On his return Brown was directed by the Board of Admiralty to publish his plants, and the commencement appeared in 1810, as the 'Prodromus Floræ Novæ-Hollandiæ,' and another contribution in 1814, as the Appendix to Captain Flinders's Voyage. The first of these works, though a fragment, has for half a century maintained its reputation unimpugned, of being the greatest botanical work that has ever appeared.

Captain King's voyages come next under review, and owing to that able officer's own love of natural history, and the encouragement he consequently gave to the botanist, Allan Cunningham, who accompanied him, his surveys have been the means of adding very largely to our knowledge of the vegetation especially of tropical Australia. As however the botanical interest of his expeditions centres in Mr. Cunningham, who was even more celebrated as an inland explorer and Colonial botanist than as the companion of Captain King, I shall include a notice of the principal points touched at by Captain King in the following brief sketch of Cunningham's career.*

Allan Cunningham (born 1791) was, when a young man, engaged at Kew in the preparation of

* Extracted from the interesting biographical memoir of Allan Cunningham, by R. Heward, Esq., F.L.S., and published in the Journal of Botany, vol. iv. p. 231, and Lond. Journ. Bot. vol. i. p. 107.

Aiton's 'Hortus Kewensis,' and was thence, in 1814, despatched, through the instrumentality of Sir J. Banks and Mr. Aiton (King's Gardener at Kew), on a botanical mission to the Brazils, and thence, in 1816, to New South Wales. In 1817 he accompanied Lieutenant Oxley's* expedition to explore the Lachlan and Macquarrie rivers. This journey, a toilsome and painful one of 1,200 miles, extended across the Blue Mountains, within the parallels of 34° 30′ and 32° S. lat., and 149° 43′ and 143° 40′ E. long., and produced about 450 species of plants.

After his return to Sydney, Mr. Cunningham was engaged as botanist to Captain King's surveying voyage, and arrived in the 'Mermaid' at King George's Sound, early in 1818: here traces of Vancouver's garden were searched for in vain. Thence they proceeded to the islands and west coast near Dampier's Archipelago, the Goulburn islands, and visited Timor before returning to Port Jackson. This voyage seems to have yielded very few novelties, for in a letter to Mr. Heward he says that the aggregate of his collections made on the coasts of Australia, does not exceed 300 species.

Subsequently Mr. Cunningham visited the Illawarra district, perhaps the richest botanical province in Australia, and in 1818 accompanied Captain King to Hobarton and Macquarrie Harbour.

The survey of the north and west coasts was commenced by King in the 'Mermaid,' in May, when Port Macquarrie and the Hastings River were visited, and the following places were successively touched at,—Rodd's Bay, Percy Isles, Cleveland Bay, Halifax and Rockingham Bays, the Endeavour River: after passing through Torres Straits, they stood across the Gulf of Carpentaria to Liverpool River and Goulburn Islands for the second time, Vernon Islands, Cambridge Gulf, and Port Warrender, whence they again visited Timor before returning to Port Jackson.

The third voyage of the 'Mermaid' was undertaken in June, 1819, when Cunningham visited Port Bowen, the Endeavour River, Lizard Island, Cape Flinders, Pelican, Haggerston, and Cairncross Islands, Goulburn and Sim's Islands, Montague and York Sounds, Port Nelson, Brunswick Bay, and returned to Port Jackson in December.

In 1821, the survey was continued, when Cunningham visited Percy Islands, Cape Grafton, Lizard Island, Cape Flinders, Clark's Island, and for the third time, Goulburn and Sim's Islands, Careening Bay, Prince Regent's River, and Hanover Bay, whence they proceeded to the Mauritius to refit. Thence they sailed to King George's Sound, where Cunningham found no traces of his own garden, formed (in 1818) with great labour. Thence they proceeded up the west coast to Dirk Hartog's Islands and Cygnet Cove, whence they sailed for Port Jackson, where terminated Cunningham's connection with the coast survey.

In 1822, Cunningham again visited Illawarra, and afterwards crossed the Blue Mountains, to the water-heads of the Macquarie. On his return to Sydney in January, 1823, he prepared for a more extended expedition, in which he opened up some of the most fertile districts of New South Wales. Starting from Bathurst he proceeded to the Liverpool Plains, to which he descended from the Pandora's Pass, discovered by himself, on the Blue Mountains, and visited the valleys beyond Hawksbury Vale.† In November, 1823, he again left Sydney to explore another pass that had been discovered leading to the Hawksbury.

In 1824, Cunningham visited the southern parts of the Colony, by Camden, Argyll, Lakes George and Bathurst, the source of the Murrumbidgee, Brisbane Downs, and Shoalhaven Gullies.

* See Journals of Two Expeditions into the Interior of New South Wales, by John Oxley, Lieut. R.N. 4to, 1820.

† An Account of this journey will be found in Field's 'New South Wales,' p. 133.

In the autumn of the same year he visited Illawarra for the third time, and still later in the year he explored the Brisbane River with Lieutenant Oxley.

In 1825 another expedition to the north-west was undertaken by Cunningham. Crossing the Nepean he proceeded to the southern feeders of the Hunter, and thence to the Pandora's Pass, descended to the Liverpool Plains, and ascended the Camden Valley to lat. 30° 47′ S., long. 150° E. The three last months of the same year were spent in examining Wellington Valley, and the six following at Cox's River and the Illawarra district.

In 1826, Cunningham visited New Zealand. Returning in January, 1827, he undertook the command of another most arduous expedition, in which he skirted the Liverpool Plains, crossed the Peel and Dumaresq Rivers, and discovered Darling Downs, in lat. 28° S., Cumming's Downs, and Peel's Plains, and after making various detours, returned to the Hunter's River, and thence by a new route to Paramatta and Sydney.

In 1827 and 1828, Cunningham was collecting at Bathurst and Illawarra. In June 1828, he again visited Moreton Bay* with Mr. Fraser the colonial botanist, made an expedition to Mount Lindsay, to the Limestone station in Bremer River, discovered another pass across the mountains, proceeded north-west to Hay's Peak and Lister's Peak, and returned to Brisbane and Sydney.

In 1829, Cunningham again explored the Blue Mountains, and in May of the same year took a third voyage to Moreton Bay, visited the head-waters of the Bremer and Campbell's Range, Norfolk Island, and Phillip Island, and returned to Sydney. In December he visited Illawarra and Broken Bay.

In January, 1831, Cunningham crossed the Blue Mountains to Cox's River, and in February he sailed for England, where he took up his residence at Kew. In 1832, owing to the death of Charles Fraser, the situation of Colonial Botanist in New South Wales fell vacant; it was offered to Cunningham, but he declined in favour of his brother Richard, who reached Sydney in 1833, and was murdered in Mitchell's journey in 1835. The appointment was thereafter again offered to Allan Cunningham, and being accepted, he sailed for Port Jackson in 1836. The duties expected from the Colonial Botanist were however, at that time, neither scientific nor such as any one having the good of the colony at heart could conscientiously perform, and Cunningham soon resigned the appointment.

In 1838, Cunningham again visited New Zealand, and returned in the same year to Sydney. His labours were now rapidly drawing to a close; his originally robust and long severely tried constitution having been gradually undermined during twenty-two years' incessant travelling, was now found to have been so irremediably shattered in New Zealand, that he was in 1839 reluctantly compelled to decline accompanying Captain Wickham in his survey of the north-west coast; soon after which he died, in the Botanic Garden, Sydney, in June 1839, at the early age of forty-eight.

I have dwelt at length upon Allan Cunningham's botanical travels, because they are by far the most continuous and extensive that have ever been performed in Australia, or perhaps in any other country. His vast collections were, for the most part, transmitted to Kew, whence they were transferred to the British Museum. A very complete set was however given to Sir W. Hooker, and his own private herbarium was left to his early and attached friend *R. Heward, Esq., F.L.S.*, from whose memoir most of the above information is abridged.

Cunningham's most important published works consist of an Appendix to 'King's Voyage,' and the 'Prodromus Floræ Novæ-Zelandiæ,' published in the 'Companion to the Botanical Magazine' and the 'Annals of Natural History.' He also wrote 'A Specimen of the Indigenous Botany of the

* I find in Sturt's Australia (vol. i. p. 154) that an account of this journey was published in Sydney.

Blue Mountains,' the result of observations made in October, November, and December, 1822, prepared in 1823, and published (1825) in Field's 'Australia,' p. 323; and a 'Journal of a Route from Bathurst to Liverpool Plains in 1823,' *ibid*, p. 131.

Captain King was succeeded by Captain Wickham, who in 1837 commissioned H.M.S. 'Beagle' to explore certain parts of north-western Australia, and the best channels through Bass' and Torres' Straits. Owing to Captain Wickham's illness the command devolved on Captain J. Lort Stokes, who drew up the narrative of the voyage. No botanist accompanied the Expedition, nor is there in the narrative any information of importance on the vegetation of the coasts surveyed; but Mr. Bynoe, the surgeon, made some valuable collections, chiefly on Dupuch Island, the Abrolhos, the Victoria River, Bass' Straits, and in New South Wales, which are preserved in Sir W. Hooker's herbarium. The 'Beagle' returned to England in 1843.

The establishment of Port Essington was founded in the year 1838, by Sir Gordon Bremer. Mr. M'Gillivray was stationed at it for some time during the Expedition of Captain Blackwood; and Mr. Armstrong, a collector sent by Kew Gardens, resided there for several years, and made important collections, a considerable portion of which are in Sir W. Hooker's herbarium.

In 1840, Captain Sir James Ross visited Hobarton in H.M.SS. 'Erebus' and 'Terror,' and spent the months of August, September, and October there, during which extensive collections were made by Dr. Lyall and myself, in the Derwent, and in the Lake district of Tasmania, and at Port Arthur.

In 1841, the same Expedition returned to Hobarton to refit, and stayed through March, April, and May, when the botanist visited the Huon River and Richmond districts. From Tasmania the Expedition proceeded to Port Jackson, where also a considerable herbarium was formed, chiefly in the neighbourhood of Sydney and Botany Bay.

In 1842, Captain Blackwood was sent out in H.M.SS. 'Fly' and 'Bramble,' to make a further survey of the tropical coasts of Australia, in which voyage he was accompanied by Mr. M'Gillivray, as Naturalist. The narrative of the Expedition was written by Mr. Jukes (Geologist to the Expedition), and contains no botanical matter. The coasts and islands visited by the 'Fly' and 'Bramble' had been previously explored by Cunningham, and subsequently by Mr. M'Gillivray, a skilful naturalist, in H.M.S. 'Rattlesnake,' whose collections were sent to Sir W. Hooker.

In 1847, H.M.S. 'Rattlesnake' was fitted out by Captain Owen Stanley, to discover openings through the Barrier Reefs in Torres' Straits, to the northward of Raine Island passage, to examine Harvey Bay as a site for a new settlement, and to make a general survey of the Louisiade Archipelago.

Many places were visited between Sydney, Cape York, and Port Essington, and excellent collections made at Port Curtis, Rockingham Bay, Port Molle, Cape York, Goold, Lizard, and Moreton Islands. The Expedition was accompanied by Mr. M'Gillivray, upon whom the task of editing the narrative of the voyage devolved, owing to the death of its commander, in Sydney. Mr. M'Gillivray's narrative abounds in interesting observations on the vegetation of Australia. Among the most noticeable discoveries are, that of a clump of Cocoa-nuts on Frankland Islands, whence, no doubt, the nuts and husks were washed to the mainland, where they had excited the curiosity of Cook, King, etc.; of *Caryota urens* and a native *Musa*, on the Peninsula of Cape York, and of the *Balanophora fungosa* in Rockingham Bay. The author also mentions the existence of the Pomegranate on Fitzroy Island, where (if no error exists) it has no doubt been planted.

The account of Mr. Kennedy's disastrous attempt to penetrate from Rockingham Bay to Port Curtis is appended to Mr. M'Gillivray's work; it terminated in the murder of its leader, and death,

by starvation, of most of his party. Amongst the survivors was Mr. Carron, the botanist, whose narrative is full of excellent observations on the vegetation of the swampy and almost impracticable country traversed. It includes the notice of a *Nepenthes*, which, with the rest of the collection, was lost. Mr. M'Gillivray's herbarium was given to Sir W. Hooker, and contains several hundred species in excellent preservation.

The only other English naval expedition remaining to be noticed is that of Captain Denham, now surveying the Pacific Islands in H.M.S. 'Herald.' He was accompanied by Mr. M'Gillivray and a botanical collector: and has sent some interesting collections from Lord Howe's Island, between Australia and New Zealand, and from Dirk Hartog's Island and Sharks Bay.

The French Expeditions rank next in importance to the British. Of these the first is that of D'Entrecasteaux. In 1792 the French Expedition, under General D'Entrecasteaux, visited Tasmania and south-western Australia. Considerable collections were made by M. J. J. Labillardière, who published figures and descriptions of 265 of the most interesting in his 'Novæ-Hollandiæ Plantarum Specimen,' 2 vols. 4to, Paris, 1804, and described a few others in the narrative of the voyage, which was written by himself, a work accompanied by folio plates of several of the plants.

In 1800, the Expedition of Captain Baudin, in the 'Géographie,' 'Naturaliste,' and 'Casuarina,' left France on a voyage of discovery and survey along the shores of Australia. Out of a large staff of naturalists, MM. Leschenault de la Tour, the botanist,* and Riedlé, Sautier, and Guichenot, all gardeners, seem to have been chiefly occupied with the botanical department, and formed large collections, which are now in the Jardin des Plantes. They were collected principally on the islands of the north-west and west coasts, in Tasmania and New South Wales. These were not published in a connected manner, but they gave rise to various papers, in the 'Mémoires du Muséum' and 'Annales du Muséum,' by Desfontaines and others.

Some general remarks on the botany of Australia and Tasmania are given by M. Leschenault in the second volume of the Narrative of the Expedition (4to, Paris, 1816); and many of the plants figured in the fine work of M. Ventenat, 'Jardin Malmaison,' were introduced into Europe by the officers of this voyage.

In 1818 and 1819, Captain Freycinet's Expedition in the French corvettes 'Uranie' and 'Physicienne' visited the Baie des Chiens Marins on the west coast of Australia, where considerable collections were made by M. Gaudichaud, and afterwards, at various parts of New South Wales, Port Jackson, Botany Bay, the Blue Mountains, etc. A few of the plants were published by the same naturalist and others,† in a quarto volume of letterpress and folio of plates (Paris, 1826).

In 1824, Captain Duperrey visited Sydney in the corvette 'La Coquille,' on a voyage of discovery. She carried two naturalists, M. D'Urville (afterwards the celebrated Admiral, and an ardent botanical collector), and Lesson, an accomplished zoologist. A portion of the plants of this voyage were published in 1829, by MM. Brongniart, D'Urville, and Bory de St. Vincent, in a series of 78 folio plates, and a quarto volume of 232 pages; both parts are however incomplete.

In 1827 the French discovery-ship 'L'Astrolabe,' commanded by Captain D'Urville, visited Port Jackson; she was accompanied by M. Lesson, as naturalist. Some botanical collections were made, but more important ones were received from Mr. Fraser, Superintendent of the Sydney Botanic

* Two other botanists, A. Michaux (afterwards author of the 'Sylva Americana'), and J. Delisse, also embarked on this expedition, but left it at the Isle of France, on the outward voyage. Bory de St. Vincent, afterwards eminent as a botanist, embarked as zoologist, and was also left at the Isle of France.

† The Lichens and Fungi by Persoon, *Algæ* by Agardh, Mosses and *Hepaticæ* by Schwægrichen.

Gardens. Of these a few were published by Lesson and A. Richard, in 1832, in an octavo volume of letterpress, and folio of plates.

Captain D'Urville again visited Australia, Sydney, and also Tasmania, when on his memorable voyage to the Antarctic regions in 1839, when collections were made by MM. Hombron and Jacquinot, the medical officers of the Expedition, at Sydney, Port Essington, Raffles Bay, etc., but very few of them have been published.

The United States Exploring Expedition, under Commodore Wilkes, visited Tasmania and Sydney in 1839, and large collections were made, near Port Jackson, etc. These have been in part published by Professor Asa Gray, of Harvard University, Cambridge, in his excellent 'Botany of the United States Exploring Expedition,' of which one quarto volume of letterpress and one folio volume of plates alone have hitherto appeared.

The Austrian exploring-frigate 'Novara' has returned to Europe during the passage of these sheets through the press, and has no doubt brought valuable collections, but I am not aware of their nature or extent.

II. LAND EXPEDITIONS UNDERTAKEN BY ORDER OF THE HOME OR COLONIAL GOVERNMENTS.

The first Colonial Expeditions that added much to our knowledge of the botany of Australia were those of Lieutenant Oxley, Surveyor-General of New South Wales, across the Blue Mountains. Mr. Oxley started on his first expedition, in 1817, to ascertain the course of the Lachlan, and was accompanied by Allan Cunningham, as King's Botanist, and Mr. Fraser, as Colonial Botanist. Early in 1818, Mr. Oxley, with Mr. Fraser, again left Sydney, to examine the course of the Macquarie. On both these occasions large collections were made, and the journal of the Expedition was published by Lieutenant Oxley in one quarto volume (London, 1820).

The land expeditions of Allan Cunningham, in 1826 and 1827, are the next in date; they have been already noticed (at p. cxiv.). Captain Sturt's Expedition was despatched to follow up Cunningham's and Oxley's discoveries.

Captain Charles Sturt, an officer of his Majesty's 39th Regiment, then on military duty in New South Wales, was commissioned by the Colonial Government to ascertain the course of the rivers rising on the western watershed of the Blue Mountains. He accordingly left Sydney in 1828, proceeded to the Wellington Valley, then the most remote north-western settlement, and proceeded down the Macquarie to the Darling River, whence he returned to Sydney. In 1829 another Expedition was fitted out, under Captain Sturt, and despatched to the Murrumbidgee River, when the Murray was discovered, and named, and followed to its debouche in Lake Alexandria, and thus into the sea, from whence the Expedition returned by the same rivers. There are no botanical observations in the narrative of these remarkable and interesting journeys, nor is there any notice of collections having been made.

In 1844, Captain Sturt started from Adelaide on another and still more remarkable journey, when, advancing north into the heart of Australia, he reached the 25th parallel of latitude in longitude 139 E. On this occasion a considerable collection was made, amounting to about 100 species, some of which were described by Brown in the appendix to Captain Sturt's narrative of the Expedition.

Captain (now Sir George) Grey's Expeditions on the west coast of Australia were organized in the hope of discovering a large river or inlet which was supposed to exist in that quarter. The

party arrived in Hanover Bay (lat. 15° S.) in 1837, whence several inland journeys were made to the south-west, and the Glenelg River discovered.

Captain Grey's second expedition was made in whale-boats, which he took with him in a sailing-vessel from Swan River. He first landed on Bernier Island (lat. 25° S.), where he made a depôt; thence he crossed to the Gascoyne River, and explored the coasts for some miles to the northward, and after encountering great difficulties and hardships, he returned to Bernier Island, where he found that the stores had been utterly destroyed by the ocean, which during the stormy interval had swept over the island. This obliged Captain Grey to return to the mainland, which he reached at Gantheaume Bay (lat. 27° 50′ S.). Here the boats were abandoned, and the overland journey to Swan River commenced, which was reached by a remnant of the party after having suffered incredible hardships from starvation and the natural difficulties of the country. Of course no collections of plants were brought back, but the commander's narrative abounds in valuable observations on the vegetation of the countries visited. Amongst many other observations worthy of note, are that of an *Araucaria* occurring on the mountains of the interior, of a Swan River *Banksia* near Prince Regent's River, of *Xanthorrhœa* attaining the latitude of 28°, and *Zamia* of 29°, in which latitude the common Sowthistle appears to have been found abundantly. Many notices of edible plants are scattered through the narrative, including that of a 'Wild Oat,' with large grains, which Captain Grey states has been cultivated with success as a cereal in the island of Mauritius.

Major Mitchell's extensive journeys come next under review, and owing to his great fondness for natural history, and excellent system of observation, his writings and his collections have both proved eminently useful in advancing our knowledge of Australian botany.

Mitchell's first Expedition originated in a report of the existence of a large river in central Australia, called the Kindur, in search of which he started in November, 1831. His party proceeded northward from Sydney, crossed the rivers Hawkesbury and Hunter, and then the watershed in lat. 32° S., long. 151° E.; thence they traversed Liverpool Plains, and traced the Gwydyr to lat. 29° S., returning to Sydney in March. The collections were divided between Mr. Brown and Dr. Lindley.

The second Expedition was organized in 1835, to explore the course of the Darling River. On this journey the Boga? River was followed from its sources to its junction with the Darling in lat. 30° S., long. 146° E., and the latter river, thence traced in a south-western direction to lat. 32° 30′ and long. 142° 30′. Richard Cunningham, the brother of Allan, who was then Colonial Botanist, accompanied Major Mitchell, and was murdered by the Blacks. The plants were given to Dr. Lindley, by whom many have been described in notes to the 'Journal of the Expedition.' The *Trigonella suavissima* was found on this journey, and copiously used as an excellent Spinach.

Mitchell's third Expedition left Sydney in 1836, with the object of following the Darling from the point where he had left it to its confluence with the Murray. This plan was however modified, and the Lachlan river was followed instead to its junction with the Murrumbidgee, and the latter to its confluence with the Murray, which was traced to the Darling in lat. 34° S. and long. 142° E.: thence the party returned to the Murrumbidgee, and proceeded in a south-western direction to the mountains of Victoria. There Mount William (alt. 4,500 feet) was ascended, and many plants found and observations made on the peculiarity of the alpine vegetation. In July the party reached the Glenelg River, and followed it to the sea at Discovery Bay, in Bass' Straits, which they reached in August. The return journey was made through the heart of the Victoria alps, crossing the Bagungum, Mur-

ray, and Murrumbidgee rivers high up in their course, and reaching Goulburn in New South Wales in the following November. In this very extraordinary journey Mitchell was accompanied by a good plant-collector named Richardson, and the collections were brought safe and in good condition to Sydney, and sent to Dr. Lindley, by whom many have been described.

The narratives of the three journeys were published in two volumes, 8vo; they abound in useful and instructive information to the geographer, and especially to the naturalist. Dr. Lindley's descriptions are appended as notes to the pages of the volume, and render it a most important work to the botanist.

Mitchell's fourth Expedition was to subtropical Australia, and was undertaken in the hope of discovering a river flowing into the Gulf of Carpentaria, which would take much of the Australian produce to the sea without passing through Torres Straits. Very fine collections were made in this journey, chiefly amongst a group of mountains 2–3,000 feet high, discovered in lat. 25° S. and long. 147° E. The plants were given to Dr. Lindley and Sir W. Hooker, by whom descriptions were drawn up and appended to the narrative of the journey, which was published in 1848.* Like Mitchell's other works, this contains excellent landscapes from sketches made by himself, which give faithful as well as artistically good views of the vegetation he describes, and render his works as attractive as they are useful to the naturalist.

In 1844 the lamented Dr. Ludwig Leichardt, after spending several years in New South Wales, started on his adventurous journey from Moreton Bay to Port Essington. This Expedition originated in private enterprise, but it was promoted by a public subscription in the colony, and I have hence classed it amongst the Colonial enterprises. Starting from Moreton Bay, he proceeded north-west to the Gulf of Carpentaria, coasted its head, and travelled northwards through Arnheim's Land to Port Essington, which he reached after a journey of a year and two months.

The narrative of Dr. Leichardt, who appears to have had a very considerable knowledge of botany, contains as much Botany as Geography, and is by far the fullest published detailed account of the tropical vegetation of the interior of Australia that we possess.

In December 1846, Dr. Leichardt started from Sydney with the view of crossing Australia from Moreton Bay to Swan River, a journey which he calculated would occupy two years and a half. Since his departure, however, from a point on his previous journey, a little to the north-west of Moreton Bay, nothing has been heard of this accomplished man and adventurous explorer.

Dr. Leichardt's collections became, I believe, the property of his friend the late Mr. Lind, barrack-master in Sydney, and were eventually sold.†

In 1840, Captain Eyre's perilous journey from Adelaide to the Swan River proved the utter sterility of the waterless coast which he traversed. Between the meridians of Streaky Bay and Lucky Bay there appears to be scarcely any vegetation at all, except on the outlying islands, on some of which Brown had botanized when in Flinders' voyage, and on which he appears to have found very little. At the meridian of 118° again the peculiar vegetation of south-western Australia commences, as we know from Mr. Roe's explorations, which next come under review.

In 1848 a journey of discovery into the interior of south-western Australia was undertaken by J. S. Roe, Esq., Surveyor-General, during which excellent collections of plants were made and trans-

* An abstract of this journey was also communicated to the 'London Journal of Botany' (vol. vi. p. 364) by R. Heward, Esq.

† Some further information regarding Dr. Leichardt's expeditions will be found in the 'London Journal of Botany,' vols. iv., v., vi., and vii., communicated by P. B. Webb, Esq., and R. Heward, Esq.

mitted to Sir W. Hooker. Mr. Roe started from Cape Riche, and proceeded north-east to the Bremer Range, lat. 32° 35′ S., long. 120° 30′ E., and then south-east to Russell Range, whence he returned parallel to the south coast. The narrative of this journey, which contains much botanical information, was published in the 'Kew Journal of Botany,' vol. vi.

Dr. Ferdinand Mueller's extensive journeys and important labours come next under review. They extend already over a period of ten years of uninterrupted exertion in travelling, or collecting and describing, often under circumstances of great hardship and difficulty, and are of very great merit and importance.

Dr. Mueller first resided at Adelaide,* whence he removed to Melbourne, and was appointed Colonial Botanist at Victoria. In 1853 he visited the Fuller's Range, Mayday Hills, the Buffalo Ranges, Mounts Aberdeen and Buller, and the Yarra Ranges, whence he descended to the coasts of Gipps Land, and returned to Melbourne by Port Albert and Wilson's Promontory. In this journey he traversed 1,500 miles, and collected nearly 1,000 species of plants. This journey is noticed in his 'First General Report,' which contains a Catalogue of the Flowering Plants and Ferns of Victoria.

In 1854, Dr. Mueller visited more of the mountains of the colony, and explored many of the most difficult regions of South Australia; he also visited Lake Albert, the Murray Lagoons, the Cobboras Mountains, the Snowy and Buchan rivers, and the Grampian and Victoria ranges. During this expedition about 2,500 miles were traversed, and upwards of 500 additional plants collected. These are enumerated in Dr. Mueller's 'Second Report,' in which the catalogue of Victoria plants is raised to 1,500 species.

In 1854–5, Dr. Mueller again visited the Australian alps, traversed the Avon Ranges, ascended Mount Wellington, crossed the Snowy Plains, reached the Bogong Range, and measured Mounts Hotham and Latrobe (7,000 feet), the loftiest in the Australian continent. Thence he proceeded to the Munyang Mountains, and afterwards to the south-east coast, when he returned to Victoria. The account of this journey is published in Dr. Mueller's 'Third Report,' wherein the Victoria Flora is raised to 2,500 species, including *Cryptogamiæ*, 1,700 being flowering plants.

In the intervals between these journeys Dr. Mueller has been incessantly employed in the duties of the Botanic Garden, in arranging and distributing his herbaria, and in publishing their novelties.

In 1855, Dr. Mueller accompanied Mr. Gregory in his celebrated expedition across northern Australia. Mr. Gregory's party left Sydney in a schooner, carrying their horses and all material with them. On the voyage out, Dr. Mueller collected on several islands off the east and north coasts of Australia, and landed with the party at the mouth of the Victoria River, in north-western Australia, in September. The river was ascended, and the country to the south explored to the limits of the Great Desert in lat. 18° 20′ S., long. 127° 30′ E. From the Victoria River they traversed Arnheim's Land, and keeping within a hundred miles of the sea, reached the mouth of the Albert, in the Gulf of Carpentaria, on the 30th August. Not meeting there with the expected supplies, Mr. Gregory and his party proceeded eastward, parallel to the coast, to the Gilbert River; thence they travelled south-east, crossed the head of the Lynd, reached the Burdekin, followed it to the Suttor, and the Suttor to the Beylando, the Mackenzie, and the Dawson rivers, where they reached the first settlers' station on the 22nd November, and from thence proceeded to Brisbane and Sydney, which was reached without the loss of a member of the overland Expedition.

* A sketch of the vegetation of a part of this colony, viz. of the districts surrounding Lake Torrens, by Dr. Mueller, will be found in the 'Kew Journal of Botany,' vol. v. p. 105.

This extraordinary journey is second in point of interest and extent of unknown country traversed to Leichardt's only, and, unlike his, is no less fruitful of results in a botanical than in a geographical point of view. The energies of Dr. Mueller were here taxed to the uttermost; and the collections and botanical observations which were continuously and systematically made throughout the journey were brought safe to Sydney, and abound in novelty and interest. These have been sent to Kew, and a set retained for the herbarium at Melbourne. An excellent account of the vegetation of tropical Australia was drawn up by Dr. Mueller,* and communicated to the Linnæan Society, and published in its Journal (vol. ii. p. 137), and many of the plants discovered have been published by himself in that work, in the 'Kew Journal of Botany,' and in the 'Transactions of the Victoria Institute.'

It would be beyond the object of this sketch to enter into more detail upon Dr. Mueller's publications, which will be found in his 'Reports' alluded to, in the pages of the Transactions of the Philosophical Society and Pharmaceutical Societies of Victoria, in the 'Linnæa,' in the 'Kew Journal of Botany,' and in the 'Journal of the Linnæan Society of London.'

Mr. Babbage's expedition to the countries around and north-east of Lake Torrens was undertaken in 1858. Mr. Babbage was accompanied by a plant-collector, Mr. David Hergolt, who seems to have made a good herbarium, especially considering the desert nature of the country. The results are published in a separate Report on the Botany of the Expedition, by Dr. Mueller (Victoria, 1859).

In 1858, an Expedition under Mr. A. C. Gregory was despatched from Moreton Bay to discover traces of the unfortunate Dr. Leichardt, when collections were made by that officer along and near the Cooper's River and its tributaries in subcentral Australia, which have been enumerated by Dr. Mueller in the official Report.

III. COLONIAL BOTANISTS AND GARDENS.

The first Colonial Botanist of whom I have any information was Mr. Charles Fraser, who, as I am informed, was a soldier in the 73rd Regiment, then commanded by Lieut.-Col. M'Quarie. He was an indefatigable collector and explorer, and enriched the gardens of England by numberless plants. His collections of dried plants are, I believe, in the British Museum, and many are in the Hookerian Herbarium. He visited the Swan River in 1826–7, and Moreton Bay in 1828, and wrote excellent accounts of the vegetation of those districts (see Hook. Bot. Misc. vol. i. pp. 221 and 237). Mr. Fraser also visited Tasmania, and established the Botanic Garden in Sydney. He died at the close of 1831 or beginning of 1832. On Fraser's death, Mr. John M'Lean became Acting Superintendent, and held that post till the arrival of R. Cunningham.

Mr. Richard Cunningham was appointed in 1833, and was murdered in 1835 by the Blacks, when accompanying Major Mitchell's second journey (see p. cxx.), when Mr. M'Lean again became Acting Superintendent, and continued so till the arrival of Allan Cunningham in 1836, as mentioned in the notice of his life (p. cxvi.). A. Cunningham soon after resigned, when he was succeeded by Mr. John Anderson, the botanical collector of Captain King's voyage to South America and survey of the Straits of Magelhaens, etc. It was on King's homeward voyage that Anderson was left at Sydney, where he made considerable collections, and held the appointment of Superintendent of the Garden till his death, when he was succeeded, in 1847, by Mr. Charles Moore, the present active

* See page xxxix of this Essay.

Superintendent, who has made extensive investigations, especially on the economic value of the vegetable products of New South Wales.

Of the actual date of the foundation of the Sydney Botanical Gardens I have no information. Mr. Heward, who has kindly endeavoured to trace its history for me in the records of the Colonial Office, finds the earliest official mention there, bearing date of 1817, but he thinks it was probably founded shortly after Governor M'Quarie's arrival, in 1809. There are three other botanical gardens in Australia; that of Victoria, at Melbourne, under the direction of the indefatigable Dr. Mueller; that of Adelaide, under Mr. Francis; and that of Brisbane, superintended by Mr. W. Hill, who has already made some interesting and important discoveries in the Flora of his district.

IV. PRIVATE TRAVELLERS, AND COLLECTORS SENT OUT BY HORTICULTURAL ESTABLISHMENTS OR BY PRIVATE INDIVIDUALS.

In 1788, Mr. John White landed in Botany Bay, where, or at Sydney, he was resident for seven years as Surgeon-General to the new settlement. He collected a considerable number of plants, and made drawings of others, which were sent to Mr. Wilson, Mr. Lambert, and Sir James Smith, and published by the latter botanist in 'A Specimen of the Botany of New Holland,' the 'Exotic Botany,' etc., in White's 'Journal of a Voyage to New South Wales,' and other works.

About 1800, Mr. George Caley was sent to New South Wales by Sir Joseph Banks, and botanized there during the time of Brown's stay. According to Captain Sturt, he was the first person who attempted to scale the Blue Mountains. He resided ten years in the colony, and made extensive collections, which are preserved in the British Museum. After his return to England, he was sent to the West Indies as Superintendent of the Botanic Garden of St. Vincent's, where he died.

Colonel Paterson held a military appointment in New South Wales previous to 1794, when the command of the troops in the colony devolved upon him as Captain of the New South Wales Corps (afterwards 102nd Foot). He zealously devoted himself to investigating the botany of the colony, and also of the northern parts of Tasmania, where he was Lieutenant-Governor from 1804 till 1810 during which time he founded Launceston. His plants were sent to Sir J. Banks and Mr. Brown, and some are published in the Supplement to the 'Prodromus' and elsewhere.

I have already alluded to Mr. Peter Good, who accompanied Mr. Brown in the capacity of gardener in Flinders's voyage. He was an indefatigable assistant as collector of plants, and sent a vast number of seeds home to the Royal Gardens of Kew, the plants of which are described in Aiton's 'Hortus Kewensis.'

Mr. David Burton botanized in New South Wales in 1802, but under what circumstances I have no means of determining.

In 1823–5 and 1829, the vicinity of King George's Sound, Wilson's Promontory, Cape Arid, and Lucky Bay were explored botanically by Mr. Baxter, a gardener sent out by private enterprise to collect seeds and roots of Australian plants. Many of his specimens are in Sir W. Hooker's collections, and others in Mr. Brown's, the *Proteaceæ* of which are included in the Supplement to the 'Prodromus Floræ Novæ-Hollandiæ.'

In 1823, Franz Wilhelm Sieber, of Prague, a botanical collector, formed considerable collections during a seven months' sojourn in New South Wales, which were sold in numbered sets, bearing the label, "Flor. Nov. Holl."

In 1826, Mr. Robert William Lawrence, a settler in Tasmania, commenced exploring the northern parts of that island, and forming collections, which were communicated to Sir W. Hooker up till 1832, when he died. Some of these plants were published in the 'Companion to the Botanical Magazine,' 'Journal of Botany,' 'Icones Plantarum,' and elsewhere.

In 1830, Mr. John Lhotsky visited New South Wales, the alps of Victoria and Tasmania. His collections are dispersed.

Ronald Campbell Gunn, Esq., F.R.S. and L.S., to whose labours the Tasmanian Flora is so largely indebted, was the friend and companion of the late Mr. Lawrence, from whom he imbibed his love of botany. Between 1832 and 1850, Mr. Gunn collected indefatigably over a great portion of Tasmania, but especially at Circular Head, Emu Bay, Rocky Cape, the Asbestos and Hampshire Hills, Western Mountains, Flinders and other islands in Bass' Straits, the east coast, the whole valley of the Derwent, from its sources to Recherche Bay, the lake districts of St. Clair, Echo, Arthur's Lakes, and the country westward of them to Macquarie Harbour, and the Franklin and Huon rivers. There are few Tasmanian plants that Mr. Gunn has not seen alive, noted their habits in a living state, and collected large suites of specimens with singular tact and judgment. These have all been transmitted to England in perfect preservation, and are accompanied with notes that display remarkable powers of observation, and a facility for seizing important characters in the physiognomy of plants, such as few experienced botanists possess.

I had the pleasure of making Mr. Gunn's acquaintance at Hobarton, in 1840, and am indebted to him for nearly all I know of the vegetation of the districts I then visited; for we either studied together in the field or in his library; or when he could not accompany me himself, he directed one of his servants, who was an experienced guide and plant-collector, to accompany me and take charge of my specimens. I can recall no happier weeks of my various wanderings over the globe, than those spent with Mr. Gunn, collecting in the Tasmanian mountains and forests, or studying our plants in his library, with the works of our predecessors Labillardière and Brown.

Mr. Gunn made a short visit to Port Phillip and Wilson's Promontory, and collected largely, noting all the differences between the vegetation of the opposite shores of Bass' Straits.

Mr. Collie, one of the naturalists in Captain Beechey's voyage to the west coast of North America, visited South-western Australia about the year 1832, and made collections in Swan River and Leuwin's Land.

Mr. James Backhouse visited Australia in 1832, and spent six years there. The journey was undertaken, as his narrative informs us, "solely for the purpose of discharging a religious duty," but owing to his knowledge of botany, his connection with a fine horticultural establishment (the Nursery, York), and his love of observing and collecting, the results of his journey have proved extremely valuable in a scientific point of view, and added much to our familiarity with Australian vegetation.

Mr. Backhouse first landed at Hobarton, and then, and on two future occasions, visited numerous parts of Tasmania, on the Derwent and Clyde, Macquarie Harbour, Port Arthur, Spring Bay, various stations on the north coast, and the mountainous interior; he also twice visited New South Wales, and made excursions to the Blue Mountains, Bathurst, Moreton Bay, Newcastle, Maitland, Port Macquarie, Illawarra, and Goulburn; and afterwards went to Port Phillip, Adelaide, King George's Sound, and Swan River. The journals of these various extensive journeys are extremely good, and though specially devoted to philanthropic objects, they omit no observations on natural history, and especially of botany, that their talented author considered might be worthy of such a record. Mr.

Backhouse formed a considerable herbarium, and made copious MS. notes (now in the Hookerian Library), which he liberally gave where he thought they would be most useful. Amongst his plants are many collected by Mr. (now Sir William) M'Arthur, one of the most accomplished and zealous patrons of science in Australia.

Baron Charles von Hügel, the celebrated Austrian traveller, visited the Swan River colony in 1833, and made considerable collections, some of which were published by Bentham, Fenzl, Schott, and Endlicher, in a work edited by the latter, and commenced in 1837, but never completed.

In 1838, Dr. Ludwig Preiss arrived at Swan River, and resided there for four years, travelling often with Mr. Drummond, and collecting largely. His plants were sold in numbered sets, and a complete account of them, published by various authors, in two octavo volumes, edited by Dr. Lehmann of Hamburg, and containing upwards of 2,000 species, including *Cryptogamiæ*.

Early in 1839, Mr. James Drummond, a resident in the Swan River, at Hawthornden, near Guildford, commenced preparing for sale in Europe sets of the plants of his district, which include a vast number of novelties, and rival in interest and importance those of any other part of the world. Mr. Drummond's exertions were actively continued for upwards of fifteen years, during which he made extensive journeys as far as King George's Sound in a south-east direction, and the Moore and Murchison rivers to the northward. Some accounts of his journeys and discoveries will be found in the 'Botanical Journal,' vols. ii., iii., and iv., in the 'London Journal of Botany,' vols. i., ii., and iii., and in the 'Kew Journal of Botany,' vols. i., ii., iv., v.

Dr. Lindley's able 'Sketch of the Vegetation of the Swan River Colony,' published in 1839, as an appendix to the 'Botanical Register,' is founded chiefly on Drummond's collections; and it contains a good account of many of the features of the climate and of the colony, many extremely valuable botanical notes on the plants, and figures of eighteen. Dr. Lindley records his obligations to Captain Mangles, R.N., and R. Mangles, Esq., and notices a paper on Western Australia by Dr. Milligan, published in the 'Madras Journal' for 1837.

Mr. J. T. Bidwill, a gentleman long resident both in Sydney and New Zealand, and possessed of a remarkable love of botany and knowledge of Australian plants, visited Moreton Bay and Wide Bay, and formed an excellent herbarium, which included many novelties, and was transmitted to Sir W. Hooker. Mr. Bidwill accompanied me in my excursions around Port Jackson, and impressed me deeply, both then and afterwards in England, with the extent of his knowledge and fertile talents. He was the discoverer of the *Araucaria* which bears his name, and of many other rare and interesting Australian and New Zealand plants. He died in 1851, from the effects of over-exertion, when cutting his way through the forests of eastern Australia, between Wide Bay and Moreton Bay. He was at the time engaged in marking out a new road, but lost his way, and after eight days' starvation was rescued, but only to succumb in acute pain to the injuries he had received.

In 1854, Dr. Harvey, F.R.S., Professor of Botany in Dublin, visited Australia for the purpose of investigating the Algology of its shores; he landed at King George's Sound, went overland to Swan River and Cape Riche, then to Melbourne, Tasmania, and Sydney, forming magnificent collections of *Algæ*, many of which have been already published in the 'Phycologia Australica,' in this work, and elsewhere. Amongst the many zealous collectors of the *Algæ* of the coast, not elsewhere mentioned in this sketch, are G. Clifton, Esq., of Fremantle, Dr. Curdie, of Geelong, Mr. Rawlinson, and Mr. Layard, of Melbourne, and in Tasmania, Mrs. M'Donald Smith, Mrs. W. S. Sharland, and especially the Rev. John Fereday, of Georgetown.

In 1839–42, Count Strzelecki, F.R.S., the accomplished Polish traveller, traversed the south-

eastern parts of Australia and Tasmania, but made no botanical collections. His excellent work 'On the Physical Features of New South Wales and Van Diemen's Land' is full of valuable information on all branches of science.

There are other private individuals of whose precise journeys I have no record, but who collected well, and often largely, as Major Vicary, of the Bengal Army, who seems to have been a very acute and indefatigable investigator of the New South Wales Flora, and a set of whose plants he has transmitted to Kew; Mr. Whittaker, who has sent valuable collections from Port Adelaide; Mr. G. Clowes, a gentleman who visited New South Wales for his health, and transmitted to Kew very copious and fine specimens of New South Wales plants. Mr. Robertson and Mr. Frederick Adamson, both settlers in Victoria, have formed very extensive and excellent collections there between the years 1840 and 1855, which have all been sent to Sir W. Hooker.

The Rev. Richard H. Davies has discovered many curious and some new plants on the east coast of Tasmania since the year 1833, which were communicated to Mr. Archer.

Dr. Joseph Milligan, of Hobarton (now Secretary to the Royal Society of Hobarton), has, since the year 1834, visited many parts of Tasmania, and made several most interesting discoveries, especially on its loftiest mountains and east coast.

Mr. Charles Stuart has been employed in Tasmania in collecting, at various times, chiefly, I believe, for Mr. Gunn, ever since the year 1842. Many of his discoveries have been published by Dr. Mueller, and are included in this work.

Dr. Thomas Scott collected in Tasmania, and transmitted specimens to Sir W. Hooker about 1835.

Mr. A. Oldfield (now, I believe, in Western Australia) has carefully investigated the Flora of several parts of Tasmania, and especially of the Huon River, and has also ascended some of its loftiest mountains. His name will be repeatedly found in the Tasmanian Flora, both as a zealous collector and as a careful and acute observer.

It remains only to mention my friend William Archer, Esq., F.L.S., of Cheshunt, who, after a residence of upwards of ten years in Tasmania, during which he sedulously investigated the botany of the district surrounding his property, returned to England in 1857, with an excellent herbarium, copious notes, analyses, and drawings, and a fund of accurate information on the vegetation of his native island, which have been unreservedly placed at my disposal. I am indeed very largely indebted to this gentleman, not only for many of the plants described, and much of the information that I have embodied in this work, but for the active interest he has shown during its whole progress, and for the liberal contribution of the thirty additional plates,* all of which are devoted to the *Orchideæ*, and chiefly made from his own drawings and analyses.

As these pages were being prepared, I have received from Dr. Mueller an interesting botanical account of the Paramatta district, drawn out by W. Woolls, Esq., a zealous Australian botanist.

This brief notice would be neither complete nor satisfactory did it contain no allusion to the important services rendered to the botany of Australia by a few of its most eminent statesmen and settlers, of whom I would specially allude to the late Sir John Franklin, to Sir W. Denmison, Sir George Grey, and Sir Henry Barkly, as Governors, who have specially interested themselves

* The grant of her Majesty's Treasury towards this work is wholly laid out in the payment of the illustrations, and provided for only 170 of these. The remainder were defrayed out of a sum of £100, liberally placed at my disposal by Mr. Archer, to be expended on the work.

FLORA OF TASMANIA.

Nat. Ord. I. RANUNCULACEÆ.*

This Natural Order, though placed by De Candolle at the head of the series, is, as is well known, by no means entitled, from any real perfection of structure, to so high a position,—a subject to which I shall return in an Introductory Essay to the classification of Australian plants, which will be appended to this Work. In distribution it is almost cosmopolitan, being very rare, or absent only in humid tropical jungles, abounding in all temperate regions, wet and dry, advancing to the utmost limits of phænogamous vegetation towards either pole, and ascending to 18,000 feet elevation in the Himalaya. Some species, as the Tasmanian *R. aquatilis*, are found in both hemispheres, and in many widely sundered localities. Very few of the many genera it contains are peculiar to the southern hemisphere; nor are there any very remarkable southern forms, except the Tasmanian *Anemone*, and the curious Fuegian species of *Hamadryas* and *Caltha*. The latter genus is anomalous, in being absent from Tasmania, and found both in New Zealand, Fuegia, and perhaps in South-eastern Australia; it may yet occur in the mountains. On the whole, Tasmania is remarkable for the few forms of *Ranunculaceæ* it presents. About twenty-six Australian species are known, including the Tasmanian ones.

Ranunculaceæ are singularly protean in habit and botanical characters, and this in every sense, for there are not only many modifications of structure by which the groups, genera, and species are limited, but the individual species are extremely variable. Even the three Tasmanian genera of the Order prove this, including, as they do, shrubs and herbs, annual and perennial, opposite and alternate leaved plants, with simple and compound leaves, single and double perianths, unisexual and bisexual flowers, valvate and imbricate æstivation, petals with and without scales at their bases, and ovaries with erect or pendulous ovules. On the other hand, several of the Tasmanian species of *Clematis* and of *Ranunculus* seem to be blended by varieties with one another, and with the species of New Zealand, Fuegia, and even Europe; for though *R. lappaceus* and *sessilifolius* are very distinct-looking plants from the ordinary English forms of *R. acris* and *R. parviflorus* respectively, it appears to me possible that they will one day be united by intermediate forms, found at the Cape of Good Hope, India, South America, and other intermediate countries. It is however in the European genera of the Order that the greatest deviations from a common type of structure in *Ranunculaceæ* occur; and these are so many and great as almost to preclude the possibility of defining

* A synopsis of the Australian Natural Orders will be appended to this Work.

it. *Pæonia, Delphinium, Aquilegia, Adonis, Actæa,* and other plants common in the gardens of Tasmania should be examined, for they show, besides the modifications mentioned above, that the carpels are often many-seeded, and fruit sometimes berried, the sepals and petals extremely irregular, the calyx or corolla absent, the stamens assuming extraordinary forms, the scale or pit on the petals of *Ranunculus* becoming the spur of the Columbine, etc. The torus presents an enormous disc in *Pæonia.*

All *Ranunculaceæ* are more or less acrid, and when highly so are very poisonous; *Clematis* is however inert, and the acrid principle is so sparingly developed in the roots of some tuberous *Ranunculi,* that they may be eaten with impunity. I know of no Australian or Tasmanian species having been turned to any profitable use. The structure of the wood of *Clematis* is very curious. The other Australian genera of the Order are *Myosurus,* and probably *Caltha,* which both occur in New Zealand. Of these *Caltha* is the most remarkable; I have seen no Australian specimen of it, but according to a letter just received from Dr. F. Müller, that botanist appears to have discovered it on the Alps of South-eastern Australia.

Gen. I. CLEMATIS, *L.*

Sepala 4–8, valvata. *Petala* 0. *Stamina* 6 v. plura. *Carpella* plurima, in caudam plerumque plumosam producta.

Sepals valvate. *Petals* 0. *Stamens* generally many. *Carpels* many, with one pendulous ovule, and a style which becomes lengthened into a feathery awn.—Shrubby plants, climbing by their leaf-stalks, rarely erect, with woody stems, and compound or pinnatisect, rarely simple, opposite leaves.

The majority of the Tasmanian and Australian species (of which there are six or eight) appear, like the New Zealand ones, to be partly or wholly diœcious, the male flowers bearing imperfect pistils, and the female flat filaments with imperfect anthers. Most of them have the connective of the anther produced into a spur or point of very variable length, and which is sometimes jointed on to the top of the anther. This peculiarity distinguishes all the Tasmanian species, except *C. linearifolia,* from the New Zealand ones. Steudel (Plant. Preiss.) indeed states the *C. indivisa* of New Zealand to be a native of South-eastern Australia; but this is not only most improbable, but the character he gives does not suffice to identify that plant. The species are extremely variable, especially in amount of pubescence, size of leaves, leaflets, and flowers, and size and shape of sepals, but not more so in these respects than are their European and Asiatic congeners. All belong to one section of the genus, except the structure of the anthers be used to divide the species: and this character, though so easily appreciated in the Tasmanian species, is not so in some American ones, where the anthers terminate in mere points. The inflorescence consists of either one-flowered axillary peduncles, or compound panicles, which are reduced branches with small leaves or bracts at the axils. Mr. Gunn has sent me copious notes on this genus, which prove that the species are as difficult to distinguish in a living as in the dried state. All have sweet-scented flowers. (Name from *κλημα, a vine-shoot,* which the long branches resemble in growth.)

1. **Clematis coriacea** (DC. Syst. i. 146); scandens, foliis ternatis v. biternatis, foliolis basi 3-nerviis ovatis cordatis ovato- v. oblongo-lanceolatis anguste-lanceolatisve integerrimis v. varie grosse v. argute serratis, sepalis 4 linearibus lineari-oblongisve acutis obtusisve, aristis antherarum loculos $\frac{1}{4}$–$\frac{1}{2}$ æquantibus, carpellis latis pubescentibus.—*DC. Prodr.* i. 5. C. aristata, *Nob. in Hook. Journ. Bot.* ii. 399 (1840), *non DC. An* C. glycinioides, *DC. l. c.?* C. pubescens, *Endl. in Hügel En. Plant. Swan River, No.* 1. C. discolor, *Steudel, Plant. Preiss.* i. 262. (*Gunn,* 631, 773, *and* 1972.)

Hab. Throughout the Island, in thickets and forests; abundant in rich soil and very damp situations; ascending to 3000 feet.—(Fl. Nov. Dec.) (*v. v.*)

Distrib. New South Wales, South-east and South-west Australia.

Roots creeping. *Stems* sometimes 100 feet long, scandent. *Leaflets* ternate or biternate, entire, or cut, or ser-

rate, 1–5 inches long, blunt, or sharp, or cordate at the base. *Flowers* 1½ inch broad. *Anthers* with points half as long as the cells. *Carpels* hairy, broad.

I erroneously referred this in Lond. Journ. Bot. to *C. aristata*, DC., and now only assume it to be De Candolle's *C. coriacea*, for I have seen no authentic specimens of that plant; and his remark, that it closely resembles the New Zealand *C. hexasepala*, is hardly applicable to this. That author however does not seem to have appreciated the full value of the character afforded by the connectivum, whose long point distinguishes this abundantly from *C. hexasepala*. De Candolle's vars. *α* and *β*, founded on the cordate-obtuse and ovate-acute leaflets being found on different parts of the same individual, are not retained here: nor is the var. *minor* I proposed in the 'Journal of Botany,' the division and toothing of the leaves, and pubescence of the inflorescence, being equally variable.

This appears to me to be almost peculiar to Tasmania and South-west Australia, for I do not doubt but that the *C. pubescens*, Endlicher (Hügel, Swan River Plants), which is the same as *C. discolor*, Steudel (Plant. Preiss.), is a pubescent variety of it, especially as I have also the glabrous state gathered at Swan River by Drummond. From Steudel's remark, that his *C. indivisa* of South-west Australia and his new species *C. cognata* are both very closely allied to his *discolor*, it is probable that they are all one and the same species, for his descriptions contain no differential characters. Whether the *C. aristata* of De Candolle is really distinct from this I am not prepared to say: the awns of the anthers are always very much longer, nearly as long as the cells; its foliage, flowers (except the anthers), and carpels, are identical, and it seems subject to similar variations in all these organs with *C. coriacea*.

In young specimens the foliage is variegated. The very narrow-leaved states greatly resemble what *C. gentianoides* might be supposed to be, were it to assume a scandent habit and ternate leaflets. Small-leaved specimens seem to connect it with the following.

2. **Clematis blanda** (Hook. Journ. Bot. i. 241. 1834); scandens, glaberrima, foliis (parvis) ternatis biternatisve, foliolis coriaceis integris rarius 1–2-dentatis late v. anguste lineari- v. oblongo-ellipticis late oblongisve rarius lanceolatis, sepalis antherisque ut in *C. coriacea* sed floribus minoribus et carpellis angustioribus glabris.—*Hook. Comp. Bot. Mag.* i. 273, *Journ. Bot.* ii. 399. (*Gunn*, 54.)

Hab. Abundant in rich soil in shady places in the northern parts of the Island; very fragrant.—(Fl. Oct. Nov.)

Distrib. South-eastern Australia.

Roots not creeping (*Gunn*). *Stems* 4–9 feet long, scandent. *Leaves* ternate or biternate; *leaflets* small, rarely cut, ½–1½ inch long, broad or narrow, linear or oblong; usually blunt, rarely lanceolate. *Flowers* ½–1 inch broad. *Anthers* as in *C. aristata*. *Carpels* narrow, glabrous.

In the original description of this plant, and in the 'Companion to the Botanical Magazine,' the *C. coriacea* was included in this species, and indeed, except by the fruit, it is not always possible to distinguish them. The present is a much smaller and smaller-leaved plant, with generally differently shaped leaflets, seldom toothed at all always narrowed into the petiole, and very shining; all these are however variable characters.

3. **Clematis gentianoides** (DC. Syst. i. 159); erecta, rarius scandens, glaberrima, foliis plerumque simplicibus late v. anguste oblongis lineari-oblongis lineari-lanceolatisve obtusis acutisve integerrimis v. parce serratis rarius ternatis, foliolis foliis similibus, pedunculis plerumque solitariis terminalibus axillaribusque 1-floris, floribus ut in *C. coriacea* sed carpellis glaberrimis.—*DC. Prodr.* i. 8; *Deless. Ic. Sel.* i. *t.* 5; *Hook. Journ. Bot.* i. 241 *et* ii. 399, *Comp. Bot. Mag.* i. 273. (*Gunn*, 53.)

Hab. Not so common as the preceding, but found in various parts of the Colony, always in poor soil, forming a bush, or trailing on the ground.—(Fl. Oct. Nov.) (*v. v.*)

Roots creeping. *Stems* bushy, generally erect, 2 feet high, or trailing, and then longer. *Leaves* entire, rarely trifoliolate; *leaflets* of all shapes, from broad elliptic-oblong to narrow linear-lanceolate, usually 1½–3 inches long, blunt or sharp, quite entire or more or less serrate. *Flowers* white or cream-coloured, on solitary, axillary, and

terminal one-flowered peduncles, as large as those of *C. coriacea*. *Anthers* as in *C. coriacea*. *Carpels* as in *C. blanda*.

I retain this species with great doubt. I gathered it in the neighbourhood of Hobarton, on open banks and on a dry soil, where it formed a bushy plant 2–3 feet high; but on the skirts of the woods it became scandent. Mr. Gunn's specimens entirely agree with mine, and some of his, from Launceston, are also scandent: the latter are intermediate in character between *C. coriacea* and *C. blanda*, as the descriptions indicate. The erect state should be cultivated in gardens, both from roots and seeds, and in several different localities and exposures, and the results recorded. In the herbarium it is impossible to distinguish all states of the three species described above, and the local observer should be careful how he lays much stress on the habit and general appearance of the individuals of so protean a genus. Mr. Gunn appears unable to distinguish this from *C. blanda*. De Candolle gives Maria Island, which is off the east coast of Tasmania, as the habitat for this species, where it was gathered by Caley.

4. **Clematis linearifolia** (Steud. Plant. Preiss. i. 262); ramulis pubescentibus v. glabratis, foliis ternatis, foliolis ovato- v. lineari-oblongis linearibusve obtusis integerrimis enerviis 3-nerviisve, paniculis sericeis, sepalis anguste linearibus v. oblongo-linearibus dorso pubescentibus, antheris breviter oblongis obtusis.—C. stenophylla, *Frazer, mss. Hook. in Mitchell's Journey, p.* 368. *An* C. microphylla, *DC. Syst.* i. 147, *et Prodr.* i. 5? (*Gunn*, 1933.) (Tab. I.)

Hab. Sand-hills, George Town, and Flinders' Island, *Gunn.*—(Fl. Oct.)

Distrib. South and west coasts of extra-tropical Australia.

A remarkably distinct species, which may be recognized at once by the pale green colour, very narrow sepals, and short, broadly oblong, blunt anthers, that have no points whatever.—*Stems* slender, grooved; branches and panicles silky. *Leaves* extremely variable in size and amount of division; *leaflets* coriaceous, $\frac{1}{2}$–$1\frac{1}{2}$ inch long, varying from linear to broadly ovate, blunt, generally coriaceous, petiolate, quite entire, the terminal one sometimes lobed. *Flowers* very variable in size, 1–2 inches in diameter, cream-coloured. *Sepals* very narrow, often strap-shaped, downy. *Carpels* in Swan River specimens with very long awns, glabrous or downy.

This appears to me to be a common South and West Australian species, that will grow with considerable luxuriance near the sea, but in the interior becomes extremely small, with diminutive leaflets and flowers.—Plate I. Fig. 1, sepal; 2, stamens; 3, pollen; 4, the same, with the outer coat burst, and the inner protruded:—*all magnified.*

Gen. II. ANEMONE, *L.*

Sepala imbricata. *Petala* 0. *Stamina* indefinita. *Carpella* plurima; ovulo pendulo; stylo brevi.

Sepals imbricated. *Petals* 0. *Stamens* many. *Carpels* many, with one pendulous ovule, and a simple short style.—Perennial-rooted herbs, with radical divided leaves, and a few cauline ones that are whorled upon the stem and form an involucre.

Almost the only other southern species of this genus is the Fuegian *A. decapetala*, L., which is also a native of Europe and North America, and a few South African ones; none are found in New Zealand or Australia: many inhabit various parts of the northern hemisphere. (Name, the Greek one for the genus.)

1. **Anemone crassifolia** (Hook. Ic. Plant. t. 257); subpilosa, radicis fibris crassis, foliis carnosis longe petiolatis late reniformi-rotundatis trilobis trisectisve, lobis segmentisve (interdum petiolulatis) late rhombeis cuneatisve grosse dentatis, scapo unifloro superne sericeo, involucri parvi foliolis 2 trifidis incisis, sepalis 6 patentibus late obovato-oblongis, carpellis ampullaceis in stylum strictum apice uncinatum attenuatis glaberrimis sicco sub-5-costatis.—*Hook. Journ. Bot.* ii. 400. (*Gunn*, 775.)

Hab. Black Bluff Mountain, Fatigue Hill, and mountains south-west of Lake St. Clair, elev. 4–4500 feet, in peat soil, *Milligan, Gunn.*—(Fl. Jan. Feb.)

A span high.—*Leaves* small for the size of the plant, 1 inch across, very thick and coriaceous (when dry);

petioles 1–2 inches long. *Scape* a span high, most hairy towards the top, bearing about the middle two opposite trifid cut involucral leaves ½ inch long. *Flower* 1–1½ inch across, white.—This very remarkable plant has hitherto been found only on mountains in the northern part of the Colony, and may hence possibly occur on the Alps of South Australia. It belongs to a section characterized by the form of the fruit, of which a species advances as far south as Java, and differs from that section to which the South African species belong.

Genus III. RANUNCULUS, *L.*

Sepala 4. *Petala* 5–10 (rarius 0), basi foveola v. squama nectarifera instructa. *Stamina* plurima. *Ovaria* plurima, ovulo 1 erecto; *stylo* brevi simplici. *Carpella* in capitulum subglobosum disposita, stylo subulato persistente terminata.

Sepals imbricated, deciduous. *Petals* five or more, rarely 0. *Carpels* many, with one erect ovule and a simple short style.—Acrid herbs, with usually perennial roots, and both radical and cauline leaves; sometimes with scapes.

The number of *Ranunculi* in Tasmania is unusually large, compared with the extent of the flora, and the same remark applies to New Zealand; in Australia they are comparatively much less numerous. On the other hand, it must be borne in mind that the species are very variable, and hence badly defined; that several of the following may prove varieties, induced by soil and situation; and that it is not enough to examine very many specimens of each species from a few localities only, as I have done, but that each species should be observed under every variety of soil and locality. The Tasmanian *Ranunculi* belong to three sections of the genus, all widely dispersed over the globe, and only absent in low tropical localities. The persistence, and erect, spreading, or reflexed direction of the sepals, annual and perennial roots, position of the scale or pit on the petals, form of the carpels, and furrows on the peduncles, are all employed in framing specific characters, but I do not know to what extent these vary in individual species. (Name from *rana*, a frog; many of the species growing in water.)

§ 1. Batrachium.—*Water plants. Flowers white. Carpels transversely rugose.*

1. **Ranunculus aquatilis** (Linn. Sp. Pl. 781); fluitans, foliis submersis capillaceo-multifidis, emersis (dum adsunt) rotundato-reniformibus, petalis interdum nullis.—*DC. Prodr.* i. 26. (*Gunn*, 1938.)

Hab. Lake River, Grindelwald, and Formosa, *Gunn.*—(Fl. Nov.)

Distrib. South-eastern Australia. Europe, as far north as Iceland. Temperate Asia, from North India to Siberia and China. North Africa. Temperate North America, to the Polar Sea.

A floating water-weed, with long slender stems, submerged capillaceo-multifid leaves, and occasionally tripartite floating leaves, which however are not developed in the Australian and Tasmanian specimens.—This widely diffused plant has been examined by Dr. Thomson and myself with great care, when comparing the Indian forms of it with the European. We have no hesitation in pronouncing it specifically the same; and though various authors have subdivided it into many species, we believe that these are founded upon characters that vary with climate, depth of water, its permanence or intermittent supply, rapidity of current, bottom soil, and the innumerable other conditions under which it flourishes in this unstable element. There are literally no limits to the number of trifling differences in the foliage and flowers, which are seized upon to found species.

§ 2. Hecatonia.—*Root fibrous. Flowers yellow. Carpels smooth, in a globose head.*

a. *Stems not creeping or flagelliferous.*

2. **Ranunculus Gunnianus** (Hook. Bot. Journ. i. 244. t. 133); pilosus, foliis omnibus radicalibus longe petiolatis capillaceo-tripinnatisectis segmentis linearibus acuminatis, scapo robusto sericeo-piloso 1-floro, flore amplo, sepalis lineari-oblongis obtusis, petalis consimilibus nervis majoribus infra medium 3-glanduliferis, carpellis in stylum rectum trigonum attenuatis. (*Gunn*, 276.)

Hab. Western Mountains, and Hampshire Hills, elev. 4000 feet, *Gunn.*—(Fl. Dec. Jan.)
Distrib. Mount Buller, South Australia, *Dr. Muller.*

Whole plant more or less hairy or silky.—*Root* of thick, fleshy fibres. *Leaves* all radical, with stout petioles 2–4 inches long; lamina broadly deltoid, tripinnatifidly cut into many narrow fleshy linear segments. *Scape* very stout, erect, 1–7 inches long, usually very silky above. *Flower* 1½ inch across. *Sepals* membranous, linear-oblong, obtuse, one-third shorter than the petals. *Petals* five or six, linear-oblong, round at the end, which is rather dilated, each with many parallel nerves, of which the three principal expand below the middle into naked opaque glands.—The most remarkable of the Tasmanian species, and quite unlike any other. The carpels are rather fleshy, the seed covered with a loose hyaline reticulated testa, and the albumen is formed of large loose incoherent grains.

3. **Ranunculus hirtus** (Banks et Sol. DC. Syst. i. 289); patentim pilosus v. villosus, subscapigerus, foliis radicalibus plurimis longe petiolatis trisectis v. pinnatisectis (junioribus 3-lobis), segmentis sessilibus petiolatisve late obovatis obovato-cuneatisve grosse dentatis 3-lobisve, scapis (caulibusve) sæpius divisis suberectis patentim pilosis, pedunculis sulcatis, sepalis concavis plus minusve villosis, petalis late obovato-spathulatis, carpellis compressis, stylo breviuscule uncinato.—*DC. Prodr.* i. 39; *Fl. Nov. Zel.* i. 9. R. pimpinellifolius, *Hook. Bot. Journ.* i. 243, ii. 401, *Ic. Plant. t.* 260. (*Gunn,* 90.)

Var. β. *vestitus;* depressus, foliis patentim villosis hirsutisve e collo radiantibus. (*Gunn,* 635.)

Hab. Moist places: Formosa; Blackman's River, near Ross; Marlborough, etc., elev. 2–4000 feet. Var. β. In alpine marshes. *Gunn.*—(Fl. Oct. Nov.)

Distrib. New Zealand.

Root of thick fleshy fibres. *Leaves* many, chiefly radical, erect in favourable situations, spreading in alpine ones, and, as well as the stems and petioles, covered more or less with shaggy spreading hairs; *petioles* 1–4 inches long; *lamina* broadly ovate or oblong, pinnately three-lobed, or pinnatisect with two to four pairs of pinnules, pinnules petiolulate, broadly obovate-cuneate, trifid or coarsely toothed. *Peduncles* one-flowered scapes, rarely rising from a branched stem, very villous or silky above. *Flowers* small, primrose-yellow, ⅓–½ inch across. *Sepals* oblong, blunt, hairy, with membranous margins. *Petals* broadly obovate-oblong, with a small thickened gland close to the very base. *Receptacle* of the carpels pilose. *Carpels* broad, obliquely orbicular, compressed, with a short hooked style. —I have no hesitation in referring this to the New Zealand *R. hirtus*, which is a very common and variable plant. The roots, when growing in a drier soil, in New Zealand, have more slender branched fibres, and the leaves are sometimes biternately cut.

4. **Ranunculus lappaceus** (Sm. in Rees' Cycl.); appresse sericeo-pilosus v. patentim pilosus, caule (plerumque) ramoso, foliis radicalibus longe petiolatis trilobis pinnatifidis pinnatisectis v. bipinnatisectis lobis pinnisve latis angustisve varie inciso-lobatis, caulinis varie sectis, pedunculis dense sericeis, floribus amplis aureis, sepalis pilosis patentibus reflexisve, petalis late obovatis obtusis retusisve, squama nectarifera libera basilari, receptaculo et achæniis ut in *R. hirto*, sed stylis longioribus.—*DC. Syst.* i. 287, *Prodr.* i. 39; *Hook. Bot. Journ.* i. 243. R. colonorum, *Endl. Plant. Hügel.* (*Gunn,* 90 *et* 633.)

Var. α; patentim villosus, foliis pinnatisectis lobis angustis.—Ad *R. plebeium*, Br., approximat.

Var. β. *latilobus;* caule petiolisque patentim pilosis, foliis pedunculisque appresse pilosis, foliis trisectis trilobisque, lobis latis.

Var. γ. *pascuinus;* totus appresse sericeo-pilosus, foliis pinnatisectis, lobis pinnatifidis incisisque angustis. (*Gunn,* 634.)

Var. δ. *uniflorus;* minor, appresse sericeo-pilosus, foliis trilobis ternati- v. pinnatisectis, lobis parvis angustis, scapis solitariis plurimisve unifloris.—R. collinus, *Br. in DC. Syst.* i. 271? (*Gunn,* 634.)

Hab. Throughout the Colony, in various situations, abundant, representing the English Buttercup.—

(Fl. almost all the year.) Var. δ. Hampshire Hills; Marlborough, elev. 3000 feet, and Arthur's Lakes, 4000 feet; near Launceston, elev. 2000 feet.

DISTRIB. Extratropical New Holland, New Zealand, and the Cape of Good Hope.

I vainly endeavoured, when in Tasmania, to detect specific characters amongst the many forms of this protean plant growing around Hobarton and in the interior; I have again and again examined Mr. Gunn's notes and splendid suites of specimens from all parts of the Island, and I have compared all these with Australian ones from many collectors, gathered on the east, west, and south coasts, and interior, and I have in none of these occasions ever succeeded in obtaining an approach to a specific character amongst them; and as I find many of its northern congeners, and especially its very near ally the *R. acris* of Europe, to be just as variable in stature, habit, and pubescence, I have united them all, at the same time retaining names for the varieties which those who take different views of specific characters may adopt. There is a certain habit that characterizes all the varieties, and distinguishes them from all states of *R. hirtus;* but the value of such a character is very problematical: the longer styles, larger golden flowers, and less equally pinnatisect leaves, and broad flat nectarial scales, are better marks. I am very doubtful about referring the New Zealand *R. plebeius* to the Tasmanian plant, for it has very small flowers and heads of carpels, and the latter have very short styles: I find however New Holland specimens identical with the New Zealand, and others which appear to unite both these forms. The whole subject is full of difficulties; and opinions formed on a few specimens, or even on many specimens from few localities, of such wide-spread common plants, are worthless. Mr. Gunn considers var. δ specifically distinct; but it has no character but stature and scapigerous habit, which are both common to alpine forms of European species. How far *R. scapigerus* is really distinct remains to be proved.

5. **Ranunculus scapigerus** (Hook. Journ. Bot. i. 244); appresse (rarius patentim) sericeo-pilosus, foliis fere omnibus radicalibus late ovatis trilobis v. ternatisectis rarius pinnatisectis lobis late obovato-cuneatis trifidis v. trilobis lobis trifidis v. grosse dentatis, scapis unifloris elongatis rarius 2–3-floris et foliiferis pilosis, floribus parvis, pedunculis sulcatis, petalis parvis lineari-obovato-oblongis, squamula nectarifera a basi remota.—*Hook. Comp. Bot. Mag.* 270. (*Gunn*, 299.)

Var. β. *concinnus;* minor, pedunculis petiolis æquilongis brevioribusve, stylis brevioribus. (*Gunn*, 1934.)

Var. γ. *decurvus;* parvulus, foliis e radice plurimis patentibus decurvis, pedunculo foliis breviore sericeo, flore minimo.—*Gunn.* (TAB. II. *A.*)

HAB. Generally in alpine situations, preferring a humid atmosphere and rich soil, ascending to 4000 feet, *Gunn*. Western Mountains; Grass-tree Hill, Hobarton. Var. β. Alpine situations, Arthur's Lakes, and Western Mountains, *Gunn*. Var. γ. St. Patrick's River, elev. 2000 feet.—(Fl. Nov. to Jan.) (*r. r.*)

The small flowers, petals with small claws, and the nectarial scale being remote from their base, are the only tangible characters whereby to distingui-h ordinary states of this from *R. lappaceus;* but Mr. Gunn has sent from St. Patrick's River two fine specimens of a plant that bears the foliage of the present, and the large flowers of *R. lappaceus;* as however it is caulescent, I refer it to the latter. In its common state (by which, I need hardly add, I mean that state of which I have most specimens) *R. scapigerus* has many radical spreading leaves, that bear three cuneate leaflets, a long one-flowered scape, and small flowers ⅓–½ inch across; the carpels are identical with those of *R. lappaceus*. In some specimens the scapes divide, and bear two or more flowers: in var. β they are very short, the leaves are at times pinnatisect, and the carpels have shorter styles, whence the whole plant resembles more *R. hirtus* β *vestitus*, of which it may possibly be a form. The var. γ is evidently a starved but curious alpine form. The purple colour of the back of the petals appears to be quite accidental, and is seen in several of the varieties of *R. lappaceus*.—PLATE II. *A*. Var. γ. Fig. 1, flower; 2, sepal; 3, 4, petals; 5, stamen; 6, ovaries; 7, ovaries removed; 8, the same further advanced; 9, section of immature seed:—*all magnified.*

6. **Ranunculus nanus** (Hook. Journ. Bot. i. 243); pusillus, foliis omnibus radicalibus, petiolis patentim pilosis glabratisve, lamina trifida trisecta v. pinnatisecta, lobis anguste cuneatis lanceolatisve apice

incrassatis integerrimis paucidentatisve, scapis brevibus 1-floris, sepalis patentibus late oblongis, petalis flavis obovato-oblongis in unguem brevem angustatis, glandula nectarifera parva crassa subsemilunari a basi remota, carpellis stylo brevi uncinato. (*Gunn*, 1935.)

Hab. In alpine districts, elev. 4000 feet, abundant in wet places, summit of Western Mountains, Arthur's Lakes, etc., *Lawrence, Gunn.*—(Fl. Jan.)

This is one of the half-starved-looking alpine *Ranunculi*, that can only be properly characterized after the inspection of very many specimens, for, like its alpine congeners in Europe, it probably assumes many forms. The most hairy specimens resemble small states of *R. lappaceus* δ, but the glabrous ones appear widely different. The styles are neither so long as in *lappaceus*, nor so short as in *hirtus*. The nectarial scale, forming a small semilunate prominent gland at some distance from the base of the petal, seems the most tangible character.—*Root* of thick fibres. *Collum* very thick. *Leaves* generally depressed, spreading or decurved, 1–1½ inch long; petiole glabrous, or very villous with spreading hairs; lamina always nearly or wholly glabrous, entire and lobed, or cut, or three-lobed, or pinnately five-lobed; segments coriaceous, with thickened tips, quite entire or a little lobed. *Scapes* short, stout, erect or decurved. *Flowers* solitary, ⅓ inch across. *Sepals* oblong, membranous, concave, glabrous. *Petals* obovate-oblong, narrowed into a short claw, yellow. *Carpels* with short curved styles.

7. **Ranunculus cuneatus** (Hook. Journ. Bot. i. 242); acaulis v. caule decumbente crasso, pilosus v. glabratus, foliis longe et crasse petiolatis ovalibus oblongis cuneato-oblongisve apice 3–5-fidis trilobisve v. grosse dentatis, scapis radicalibus elongatis v. in axillis foliorum, floribus parvis, petalis parvis, carpellis paucis, stylo brevi. (*Gunn*, 228.)

Hab. Alpine swamps at Arthur's Lake, and on the Western Mountains, elev. 4000 feet.—(Fl. Jan.)

The original specimens of this look very distinct from any other Tasmanian species; but a second supply from Mr. Gunn presents many forms that are intermediate between it and the last. Mr. Gunn also remarks that it grows in swamps, and is under water during a portion of the year, which may account for some of its peculiarities. To me it resembles a luxuriant state of *R. nanus*, becoming caulescent or proliferous, and bearing either scapes or axillary peduncles. Some flowers appear to be apetalous, which is a further sign of abnormal condition; and its whole history requires elucidation in its native place. The nectary is as in *R. nanus*.

b. *Stems creeping or flagelliferous.*

8. **Ranunculus inundatus** (Br. in DC. Syst. i. 269); glaberrimus, debilis, caule repente v. submerso ad nodos radicante folia ramosque emittente, foliis radicalibus longe petiolatis palmatim 5-sectis lobis anguste cuneatis trilobis v. varie sectis lobulis obtusis, caulinis brevius petiolatis, floribus (parvis) longe pedicellatis, pedicellis radicalibus oppositifoliisve, sepalis obovato-rotundatis, petalis 5 stipitatis lamina lineari-oblonga basi fovea nectarifera magna transverse elongata incrassata instructis, receptaculo piloso, carpellis (sicco rugosis) 6–8, stylo elongato.—*DC. Prodr.* i. 34; *Hook. Journ. Bot.* i. 242; *Gray in Bot. of Wilkes' Explor. Exped. p.* 9. (*Gunn*, 396, 774.)

Hab. Fresh and brackish swamps, abundant; sometimes growing in deep water, on which the leaves float, *Gunn.*—(Fl. Nov. Dec.) (*v. v.*)

Distrib. New South Wales, and South-eastern Australia.

A slender marsh or water plant, everywhere quite glabrous.—*Stems* creeping, a few inches to a yard long, rooting at the joints, where they bear tufts of leaves and scapes, and slender branched stems, which have smaller leaves and one-flowered pedicels opposite to them. *Petioles* 1–4 inches long. *Leaf* palmately five-lobed, generally membranous, cut into five radiating narrow wedge-shaped leaflets, that are variously lobed and cut; sometimes the leaves are multifid, with very slender linear lobes. *Peduncles* as long as the petioles, or shorter. *Flowers* ⅓ of an inch across in Tasmanian specimens, ¾ according to A. Gray in some New Holland ones. *Sepals* membranous, very

broad. *Petals* five, narrow. *Anthers* broadly didymous. *Carpels* somewhat wrinkled in the dry state, as described in the Journal of Botany, sometimes smooth and turgid, as described by Gray.

9. **Ranunculus glabrifolius** (Hook. Bot. Journ. i. 243); glaberrimus v. parce pilosus, caule surculoso, foliis confertis radicalibus longe petiolatis palmatim 3–5-sectis, segmentis subcoriaceis anguste cuneatis trifidis trilobis trisectisve, lobis inæqualiter trifidis, ramis (caulibusve floriferis) petiolis longioribus simplicibus divisisve, pedunculis glabris sericeisve, sepalis late rotundatis, petalis 10–12 anguste obovato-oblongis breviter stipitatis, glandula nectarifera incrassata interdum biloba, carpellis turgidis (sicco) costatis stylo subrecto subulato terminatis.—*Hook. Comp. Bot. Mag.* i. 273. (*Gunn*, 157.)

Hab. Wet places, Launceston, New Norfolk, Formosa, and St. Patrick's River, etc., *Gunn, Backhouse.* Hobarton, *J. D. H.*—(Fl. Oct. Nov.)

A very distinct species, easily recognized by the numerous petals. In habit it more nearly resembles *R. inundatus* than at first sight appears, the stem really consisting of running surculi, which swell at the knots and give off such large tufts of leaves that each appears like a solitary plant. The erect branches vary extremely in size, from 1 inch to 1 foot high, and the petioles from 1 to 4 inches. *Leaves* proportionally variable in size, smooth or glabrous, rather coriaceous, 1–2 inches broad, cut as in *R. inundatus*, but into broader, firmer divisions. *Branches* simple or divided. *Flowers* golden-yellow, $\frac{2}{3}$–1 inch across. *Sepals* very broad, more or less pilose. *Petals* gradually narrowed into a short claw, above which is a thickened opaque nectarial gland, but no hollow or scale. *Carpels* distinctly ribbed when dry, but not wrinkled as described in Comp. Bot. Mag., except from the shrivelling of the coriaceous epicarp.—This species is very nearly allied to the New Zealand *R. incisus*, but in that plant the nectary is distinctly excavated, as in *R. inundatus*.

10. **Ranunculus inconspicuus** (Hook. fil.); pusillus, glaberrimus v. petiolis pedunculisque pilosis, caule repente v. surculoso, foliis omnibus radicalibus longe petiolatis trilobis tripartitisve, lobis cuneatis 3-fidis, segmentis acutis, pedunculis foliis longioribus erectis 1- rarius 2-floris, sepalis late ovatis subacutis, petalis lineari- v. obovato-spathulatis ungue brevi squamula nectarifera parva, staminibus paucis, acheniis (maturis) turgidis, stylo uncinato subulato. (*Gunn*, 1018, 1019.) (Tab. II. *B.*).

Hab. Hampshire Hills, Western Mountains, and Mount Wellington, elev. 3–4000 feet, *Gunn.*

The habit of this species is exactly that of *R. glabrifolius*, the stem running underground in marshy places, and giving off roots and a tuft of leaves, with a solitary, generally one-flowered scape. It differs in its smaller size, in the form of the nectarial gland, and in the carpels not being ribbed. I have not so many specimens as are desirable, and it is probably an exceedingly variable little plant.—*Roots* tufted, fibrous. *Leaves* erect; petioles slender, 1–2 inches long, curved, glabrous or pilose. *Segments* 3, rarely more, $\frac{1}{4}$–$\frac{1}{3}$ of an inch long, cuneate, trifid. *Peduncles* rarely two-flowered, glabrous or pilose. *Flower* small, yellow. *Petals* linear-obovate or linear-oblong, with a short broad claw, and small scale or pit immediately above it. *Carpels* turgid, with a curved subulate style.—Plate II. *B.* Fig. 1, flower; 2, sepal; 3, petal; 4, stamen; 5, ovary; 6, ripe carpel; 7, vertical section of the same; 8, embryo:—*all magnified.*

§ 3. Echinella.—*Carpel tuberculated.*

11. **Ranunculus sessiliflorus** (Br. in DC. Syst. i. 302); sericeo-pilosus v. subvillosus, caulibus gracilibus e collo plurimis parce divisis, foliis radicalibus longe petiolatis reniformi-rotundatis trilobis trisectisve segmentis integris trifidis v. tridentatis, floribus oppositifoliis sessilibus v. rarius pedicellatis minimis, ovariis pilosis, carpellis tuberculatis.

Var. β; floribus saltem inferioribus pedicellatis. (*Gunn*, 230.)

Hab. Abundant in rich and poor soil, at all elevations from the sea to 3000 feet, varying much.—(Fl. Sept. Oct.) (*v. v.*)

Distrib. Common in extratropical Australia, and New Zealand.

A very small, villous or hairy species.—*Stems* many, from one annual (?) root, spreading, procumbent, 2–6 inches long. *Leaves* radical and cauline, on slender petioles, three-lobed or three-parted; segments broad, trifid, or almost entire. *Flowers* very minute indeed, yellow, sessile in the axils of the leaves, the lower ones sometimes on slender pedicels of variable length. *Sepals* linear, oblong, membranous, with long soft villous hairs. *Petals* narrow, spathulate, the linear claw longer than the limb. *Nectary* above the middle of the petal, large, deeply excavated, with a prominent scale or lip. *Receptacle* villous. *Carpels* flat, with thickened borders, straight, flattened, triangular, somewhat curved styles, and their faces covered with small sharp warts, each often terminated by a hair.—I doubt this species proving eventually distinct from the European *R. parviflorus*, L., which is also found at the Cape of Good Hope and in North America. So far as I can judge from De Candolle's description, the *R. Pumilio* of Brown may be a variety with pedicelled flowers, which is still nearer the European plant, and I find sessile and pedicelled flowers on the same specimen. Mr. Gunn remarks that this is a most variable plant, and he does not distinguish the following from it.

11. **Ranunculus Pumilio** (Br. in DC.-Syst. i. 271); patentim pilosus, caulibus perplurimis gracilibus decumbentibus prostratisve foliosis, foliis longe petiolatis palmatim v. pinnatim 3–5-sectis v. biternatim sectis, segmentis petiolatis varie in lobulos lineares incisis, floribus axillaribus pedicellatis, receptaculo glabriusculo, carpellis ut in *R. sessiliflore* sed magis piloso v. villoso.—*DC. Prodr.* i. 35. R. leptocaulis, *Hook. Bot. Journ.* i. 244, *Comp. Bot. Mag.* i. 273. (*Gunn*, 230?)

Var. *β. pilulifer;* minor, foliis magis dissectis, floribus sessilibus pedicellatisve.—R. pilulifer, *Hook. Ic. Plant. t.* 600. (*Gunn*, 230.)

Hab. Abundant, chiefly in swampy places, from the level of the sea to 3000 feet, *Brown, Gunn.*—(Fl. Nov. to Jan.) (*v. v.*)

Distrib. Var. *β.* Swan River.

De Candolle's description seems to have been drawn up from very small, or probably seedling specimens, with some of which my small states perfectly agree. I suspect that it is not specifically distinct from *R. sessiliflorus;* Mr. Gunn also has no doubt of their being forms of one another, and I only keep them distinct because I find no exactly intermediate specimens. In size each varies from an inch to a foot; *R. sessiliflorus* is normally sessile-flowered, but occasionally pedicelled, has normally glabrous, but occasionally hairy carpels, and has generally a villous receptacle; *R. Pumilio* has normally pedicelled, but occasionally sessile flowers, usually villous, but sometimes glabrous carpels, and a glabrous receptacle, with a few marginal hairs. In the ordinary course of events it may be assumed that an abundance of intermediate forms will be found. The petals of *R. Pumilio* are smaller, but the nectary is the same, and deformed petals of both are very common. The Swan River variety is intermediate in having almost glabrous carpels, usually sessile, but often pedicelled flowers, and much divided leaves.

Nat. Ord. II. MAGNOLIACEÆ.

Gen. I. TASMANNIA, *Br. in DC. Syst.* i. 445.

Flores dioici. *Sepala* 2. *Petala* 2–5, decidua. *Stamina* plurima, extrorsa. *Ovarium* 1; *ovulis* 2-seriatis. *Fructus* indehiscens.

Diœcious or polygamous. *Sepals* two, deciduous. *Petals* 2–5, deciduous. *Stamens* many, hypogynous; *anthers* extrorse. *Ovary* solitary (rarely two), free, sessile; *ovules* in two series; *stigma* terminal, and running down the inner angle of the ovary. *Fruit* indehiscent. *Seeds* many, pendulous.—The only Tasmanian species is the well-known Pepper-plant of the Colony, which Mr. Brown selected for bearing the name of the discoverer of the Island. It congeners are one or two Australian species; but the New Zealand, Chilian, and Bornean genus *Drimys* is so very nearly allied to it, that it may almost be considered the same. These are the southern representatives of the *Magnolias* of North America, China, India, and the Malay Islands, and, like them, have more or less aromatic

bark. This is especially the case with the Chilian *Drimys Winteri*, which yields the Winter's bark of our Pharmacopœia,—a medicine which might probably be safely replaced by the bark of Tasmania.

1. **Tasmannia aromatica** (Br. l. c., Prodr. i. 78; Deless. Ic. i. t. 84).—Winterana lanceolata, *Poir. Dict.* viii. 799. (*Gunn*, 777.)

Hab. Abundant in many parts of the Island, descending to the level of the sea at Circular Head and Georgetown, and ascending to 4000 feet on the mountains; it prefers a rich soil, *Brown, etc.* "Pepper-tree," *Col.*—(Fl. Oct. Nov.) (*v. v.*)

A small bush or tree, from 3 inches high on the mountains to 12 feet in more favourable situations, often gregarious, closely resembling *Telopia truncata* in appearance (*Gunn*).—*Trunk* sometimes 9 inches in diameter, branches often three together, or obscurely whorled. *Bark* red in young branches. *Leaves* ½–3 inches long, very coriaceous, shortly petioled, lanceolate, elliptical-ovate, or linear-obovate, or obovate-oblong, extremely variable in texture, shape, and appearance, alternate or whorled, erect and appressed, or spreading, blunt, quite entire; nerves parallel to the midrib: alpine specimens have obovate leaves, glaucous below. *Stipules* none. *Flowers* inconspicuous, in small terminal corymbs, sheathed when in bud in hard coriaceous scales, pedicelled; *pedicels* slender, ½ inch long; *flower* globose, greenish, ¼ inch in diameter. *Fruit* of one carpel, black when ripe, rather fleshy, about as large as the flower. *Seeds* about 6–8, obliquely obovate, or kidney-shaped, compressed; *testa* black, brittle shining, smooth; *endopleura* coarsely reticulated and rugose, with a thickened, partially free raphe; *albumen* cylindrical, curved, of loose angular grains. *Embryo* very minute indeed, globular or very broadly clavate, notched.

The wood of this plant presents a beautiful microscopic object, each individual fibre, or rather tube, being marked with a series of orbicular discs, each of which has an inner concentric circle. In this peculiarity *Tasmannia* closely resembles many *Coniferæ*.

Nat. Ord. III. MONIMIACEÆ.

This is a small and very curious group, of which there are two well-marked Suborders (considered by many as Orders); all are natives of the Southern Hemisphere, and the genera are chiefly insular, one only (*Citrosma*) having many continental American species. Of the Suborder *Monimieæ*, there is one Australian and New Zealand genus (*Hedycarya*) not hitherto found in Tasmania. The smaller Suborder *Atherospermeæ* is much more limited: it contains three genera, which might be advantageously united under *Atherosperma*: one of these is a New South Wales species, *Doryphora Sassafras*; another, a South-eastern Australian and Tasmanian one, *Atherosperma moschata*; and the third has representatives both in Chili and New Zealand (*Laurelia*). The affinities of *Monimiaceæ* are with *Magnoliaceæ* and *Anonaceæ*, through *Myristiceæ*; for though they resemble *Laurineæ* in their anthers dehiscing by valves, they are not otherwise nearly related to that Order. All the *Atherospermeæ* are fragrant.

Gen. I. ATHEROSPERMA, *Lab.*

Flores dioici. *Perianthii* tubus hemisphæricus, limbus 6–8-fidus. *Stamina* 6–20, perianthii tubo inserta, squamulis alternantibus totidem v. nullis; filamentis basi nudis v. biglandulosis; *antheris* valvis ascendentibus dehiscentibus. *Ovaria* 5–20, unilocularia; *ovulo* 1, erecto. *Stylus* lateralis v. subterminalis, demum plumosus, stigmate simplici nudo. *Achenia* perianthii tubo hemisphærico v. urceolato inclusa. *Semen* erectum; testa membranacea, albumine carnoso. *Embryo* basilaris, radicula brevi hilo versa, cotyledonibus divaricatis.—Arbores Australasicæ, Tasmanicæ, Nova-Zelandicæ *et* Chilenses, *aromaticæ*. Folia *opposita, serrata, exstipulata*. Inflorescentia *axillaris, cymosa, v.* flores *solitarii*.—Pavonia, *Ruiz*. Doryphora, *Endl.* Laurelia, *Juss.* Thiga, *Molina.*

The genus *Atherosperma*, as thus modified, contains four species, each peculiar to the locality it inhabits. They may be divided into sections, corresponding to the three genera already instituted; but these appear to me to constitute only one genus, and that an exceedingly natural one. Brown, in Flinders' Voyage, ii. 553, mentions that there are two Australian *Atherospermæ*, and does not allude to the Monimiaceous genus (*Hedycarya*) found in the colony of Port Jackson. The perianth of *Monimiaceæ* has been described as an involucre, but analogy with *Atherosperma* would seem to be quite opposed to this view. Brown however proposed to separate *Atherospermeæ* as a distinct natural family, characterized chiefly by the flowers being provided with a perianth, by the anthers, the texture of the albumen, and the relative size of the embryo. Dr. Thomson and I have however shown (Flora Indica, i. 164) that the structure of an Indian plant of this family renders this view untenable, that both are members of one Order, and that the involucre of *Monimiaceæ* is a true perianth. (Name from *αθηρ, an awn,* and *σπερμα, a seed.*)

1. **Atherosperma moschata** (Lab. Nov. Holl. ii. 74. t. 224); ramulis foliis subtus perianthiisque extus sericeis, foliis lanceolatis grosse serratis subtus glaucis junioribus integerrimis, perianthii tubo fructifero hemisphærico, staminibus 2-seriatis 15–20 basi squamulis plurimis immixtis, antheris brevibus obtusis. (*Gunn,* 531.)

Hab. Common in beech forests throughout the Island, elev. 1–3000 feet, *Labillardière, etc.*—(Fl. Aug. Sept.) (*v. v.*)

Distrib. South-eastern Australia.

An erect tree, 100–150 feet high, with bright evergreen foliage, straight taper trunk, conical head, and whorled spreading branches. *Branchlets* terete, pubescent or tomentose. *Leaves* on short petioles, 2–4 inches long, lanceolate, acuminate, coarsely serrate or entire, downy and glaucous beneath. *Flowers* enclosed in two opposite concave villous bracts, solitary, on short villous curved axillary pedicels, unisexual.—*Males* with a short tube to the perianth, and limb 1 inch across, of eight spreading submembranous blunt segments in two series; the outer broad, rounded, silky at the back; the inner narrower, ovate-lanceolate. *Stamens* 15–20, with many scales (imperfect stamens) at the base of the filaments. *Anthers* short, blunt, with recurved valves.—*Female flowers* more densely villous and silky, with similar pedicels and opposite concave bracts. *Perianth* with a larger tube, and broader, shorter, more coriaceous segments than the male, which soon fall away and leave a truncate limb, crowned with many teeth in two rows, which are imperfect stamens. *Fruit* consisting of many achenia enclosed in the hemispherical villous tube of the perianth, which is of the size of a pea; the plumose styles exserted. *Achenia* small, membranous; silky hairs on the style simple, transparent; *stigma* a lateral flat surface on the needle-shaped glabrous apex of the style. *Seed* filling the cavity of the achenium and adherent to its walls; testa very delicate. *Albumen* copious, fleshy, oily, of large separable granules, aromatic. *Embryo* minute, at the base of the seed, immersed in the albumen, erect; *radicle* cylindrical, blunt. *Cotyledons* compressed, short, slightly diverging.—The whole plant is very fragrant, and the bark has been used for tea. It yields an essential oil like that of the Laurel, called Sassafras. The New Holland Sassafras is the allied *Doryphora Sassafras* of Endlicher.

Nat. Ord. IV. DILLENIACEÆ, *DC.*

Australia is, in respect of number of species, the head-quarters of this Natural Order, which is essentially a tropical one in every other respect: there are no species whatever in the temperate climates of the Northern Hemisphere, nor in any southern one but Australia and Tasmania; whilst their total absence in extratropical South America, New Zealand, and South Africa, renders their abundance in Tasmania one of the most singular facts in its botany and in the distribution of plants generally. It is to be remarked, however, that though there are nine species in the Colony, none are alpine, and few ascend to the subalpine zone. Their abundance, habit, and profusion of yellow blossoms recall the *Cisti* and *Potentillæ* of Europe.

Gunn remarks that the neighbourhood of the sea is the principal region of *Dilleniaceæ* in Tasmania, all the species being found within a few miles of Georgetown. They usually grow in light sandy soil, and vary much. About ninety Australian species are known, the greater number of which are found in the south-western parts; few or none of these are common to the south-eastern side; there are also a few tropical species.

Gen. I. HIBBERTIA, *Andr.*

Sepala 5, persistentia. *Petala* 5. *Stamina* indefinita, libera v. in phalanges approximata. *Ovaria* sæpius 2–5, unilocularia, ovulis e sutura ventrali ascendentibus. *Styli* terminales, divaricati. *Capsulæ* membranaceæ, intus longitudinaliter dehiscentes, 1-polyspermæ. *Semina* arillata.—Suffrutices *ramosi, sub-erecti, procumbentes v. rarius scandentes;* foliis *alternis, coriaceis;* floribus *sæpe fœtidis, terminalibus, pedunculatis v. sessilibus.*

Procumbent or erect, often rigid, small heath-like shrubs, sometimes however scandent; all are confined to Australia.—*Leaves* alternate, coriaceous. *Flowers* often fetid, terminal, solitary, peduncled or sessile. *Sepals* five· persistent. *Petals* five, yellow. *Stamens* numerous, free, or united at the base into several bundles. *Ovaries* generally 2–5, with diverging styles. *Fruit* of two or more membranous carpels, that dehisce down the ventral suture. *Seeds* rounded, attached to the ventral suture, ascending, arillate. *Testa* often shining. *Embryo* (in a Swan River species) very minute, globose, unequally two-lobed. De Candolle describes the seeds as exarillate, and Endlicher as having a generally obsolete arillus; that organ is however always present in the Tasmanian species. (Named in honour of *Dr. Hibbert.*)

1. **Hibbertia procumbens** (DC. Syst. i. 427); glabra v. sericeo-pilosa, caulibus procumbentibus foliosis, foliis linearibus lineari-obovatisve obtusis acutisve crassiusculis aveniis, floribus amplis terminalibus sessilibus, sepalis late ovato-rotundatis mucronatis, petalis obovato-rotundatis, staminibus sub-20 in phalanges 4 obscure approximatis, filamentis gracilibus, antheris brevibus, ovariis 4–5 glabris, ovulis sub-4–6, seminibus 1–5, testa pallide brunnea.—*DC. Prodr.* i. 74; *Hook. Journ. Bot.* i. 246. Dillenia procumbens, *Lab. Fl. Nov. Holl.* ii. 16. *t.* 156. H. angustifolia, *Salisb. Par. Lond. n.* 73. H. obtusifolia, *DC. l. c.* (*Gunn,* 638.)

Hab. Abundant in open heathy places, *Brown, Lawrence, Gunn, etc.*—(Fl. Oct. Nov.) (*v. v.*)

A small, spreading, depressed shrub, with slender, prostrate, leafy twigs, bright green foliage, and large golden flowers.—*Root* stout, woody. *Branches* prostrate, rarely ascending or erect, 2–12 inches long, much divided, tufted, covered with thin red bark, glabrous or pubescent towards the tips. *Leaves* usually spreading, linear, slightly expanded towards the sharp or blunt tips, $\frac{2}{3}$–1 inch long, but sometimes (*H. obtusifolia*, DC.) much smaller, obovate and erect, always nerveless, flat, and opaque, glabrous or covered with scattered silky hairs. *Flowers* 1 inch in diameter, fetid in warm weather. *Sepals* imbricate in bud, coriaceous, broad, mucronate. *Petals* one-third longer than the calyx. *Stamens* disposed in four bundles of unequal numbers. *Anthers* short, subclavate, opening by lateral slits. *Ovaries* 4–5, quite glabrous, with long styles. *Ovules* 4–6, inserted in two rows near the base of the cavity. *Seeds* 2–5, globose. *Testa* pale brown, smooth, brittle, shining; *endopleura* transparent, firmly adhering to the albumen, which is densely fleshy and oily. *Embryo* not found. *Arillus* white, one-fourth the length of the seed, split into subulate laciniæ.—Mr. Gunn remarks that a hairy form sprang up at Rocky Cape after the vegetation had been burned off the ground.

2. **Hibbertia fasciculata** (Br. in DC. Syst. i. 428); glabra v. sericeo-pilosa, ramis ramulisque virgatis ultimis brevissimis, foliis fasciculatis planis lineari-acicularibus subacutis, floribus ramulos brevissimos laterales terminantibus amplis, staminibus sub-12 in fasciculos 3–4 dispositis, ovariis 3–4 2-ovulatis.—*DC. Prodr.* i. 74. H. virgata, *Hook. Ic. Pl.* 267, *Lond. Journ. Bot.* ii. 403. ? H. camphorosma, *Sieb.* 146. (*Gunn,* 465.)

Var. β. *prostrata;* ramis brevibus prostratis, foliis brevioribus.—H. prostrata, *Hook. Journ. Bot.* i. 246, ii. 413. (*Gunn*, 642.)

Var. γ. *glabrata;* prostrata, foliis parvis glabris, ramulis brevissimis. (*Gunn*, 1023.)

Hab. Circular Head, in sandy soil, *Gunn*. Var. β. Abundant throughout the Colony; ascending to 2–3000 feet, *Lawrence, Gunn, etc.* Var. γ. Lake St. Clair, *Gunn*.—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

An erect shrub, from 6–18 inches high, fasciculately branched.—*Branches* erect, very leafy, slender; all parts perfectly glabrous, or more or less covered with long white silky hairs. *Leaves* in tufts, very narrow, ½–1 inch long, spreading, a little curved, thick, margins not revolute, grooved down the middle. *Flowers* large, ⅔ inch in diameter. *Sepals* elliptical-ovate, mucronate. *Petals* obcordate. *Stamens* about twelve, united in bundles alternating with the carpels, of three, four, and five in each bundle respectively. *Ovaries* three, glabrous. *Ovules* two. *Fruit* not seen.

This entirely agrees with De Candolle's character of *H. fasciculata*, Br., and with Mr. Brown's specimens in the British Museum, and appears the same as Sieber's *H. camphorosma*, which has rather smaller flowers, but the same leaves and number of parts. Lehmann (Plant. Preiss. ii. 236) mentions this as a native of York (Western Australia); I do not however find it amongst Drummond's plants, but there is an allied species, with revolute margins to the leaves, from that country. The var. *prostrata* is the common Tasmanian form: it was erroneously characterized originally as having a solitary carpel; it varies from glabrous to silky. I have gathered exactly intermediate forms on the sandy flats opposite Hobarton.

3. **Hibbertia virgata** (Br. in DC. Syst. i. 418); glabra, erecta, stricta, ramis tenuibus virgatis ultimis puberulis, foliis in ramulis lateralibus brevissimis sparsis fasciculatis alternisve anguste linearibus sensim dilatatis obtusis planis sulcatis, floribus ramis subsessilibus axillisve foliorum sessilibus, bracteis ciliatis ovato-rotundatis acuminatis, sepalis obovato-oblongis retusis acutis mucronatisve, petalis obcordatis, staminibus sub-10 in phalanges 3 obscure approximatis, ovariis 3 glaberrimis, ovulis 2.—*DC. Prodr.* i. 74. (*Gunn*, 1940.)

Hab. On the road from Georgetown to Currie's River, in sandy soil, *Gunn*.—(Fl. Oct.)

Distrib. South-eastern Australia.

An erect, twiggy, sparingly leafy shrub, a span high.—*Branches* very slender, slightly downy at the tips. *Leaves* alternate, or fascicled on abbreviated lateral branchlets, strict, ½–1 inch long, narrow and slender, grooved above; margins not recurved, blunt. *Flowers* axillary, or sessile on very short leafy lateral branchlets, similar to those of *H. fasciculata*, but stamens fewer, about ten, approximated in three (not two, as De Candolle says) bundles. —This is allied to some Sydney and West Australian species, but is quite distinct, and most likely confined to South-eastern Australia and the opposite shores of Tasmania, for De Candolle's locality of Port Jackson is probably erroneous; Brown's specimens in the British Museum are marked as coming from the south coast of New Holland.

4. **Hibbertia ericæfolia** (Hook. fil.); glabra, prostrata, humifusa, ramulis gracilibus ascendentibus ciliatis puberulisve, foliis (parvis) sparsis acicularibus coriaceis rigidis in petiolum brevem angustatis obtusis marginibus revolutis lævibus v. sparse minute tuberculatis superne enerviis costa inferne valida, floribus terminalibus sessilibus, bracteis parvis subulatis ciliatis, sepalis oblongo-obovatis obtusis acutis v. mucronatis glabris, petalis obcordatis, staminibus 10 in phalanges 3 obscure approximatis, carpellis 3 villosis 4-ovulatis. (*Gunn*, 1022.) (Tab. III.)

Hab. Common on the serpentine formation, Asbestos Hills; also at Launceston and Georgetown, *Gunn*.—(Fl. Oct. Nov.)

Habit of *H. procumbens*, but with smaller, more rigid and heath-like leaves, and with very different ovaries. —Prostrate, with rarely erect branches; the latter slender, pubescent or ciliated at the tips, brown. *Leaves*

¼ inch long, very narrow, quite linear, blunt, convex above, deeply grooved below from the recurved margins and strong midrib: surface quite smooth, or with a few scattered raised points. *Flowers* terminal, ½–¾ inch diameter. *Bracts* very small. *Sepals* coriaceous. *Stamens* ten. *Anthers* with the connective traversed by six canals, full of large, long, free, hyaline cells, each containing a small bundle of raphides. *Ovaries* three, very villous. *Ovules* four. *Seeds* two or three, obovate or obpyriform; testa in immature seeds brittle, pale brown. *Arillus* irregularly cup-shaped, not torn.—The structure of the connective of the anther in this (and probably other species of the genus) is very curious. In the habit, small bracts, few stamens, small foliage, and occasionally scabrid scattered points on its surface, this plant closely approaches *Pleurandra riparia*, Br. It is also very closely allied to *H. pedunculata*, Br., of Sydney, but the flowers are sessile. *H. ericæfolia*, Br. MSS. in Mus. Brit., appears to be the same as *H. fasciculata*.—PLATE III. Fig. 1 and 2, leaves; 3, back, and 4, front view of flower; 5, stamens; 6, transverse section of anther, showing the canals in the connective; 7, cells with raphides; 8, pollen; 9, ovaria; 10 and 11, sections of carpels; 12, an ovule; 13 and 14, seeds:—*all magnified.*

NOTE. *Hibbertia dentata*, a large-leaved Port Jackson species, is stated (DC. Syst. i. 427) to be a native of D'Entrecasteaux Channel,—no doubt through some mistake.

Gen. II. PLEURANDRA, *Lab.*

Omnia *Hibbertiæ*, sed staminibus unilateralibus.

This genus is not sufficiently distinct from *Hibbertia* (as at present constituted) to render its adoption anything but a matter of convenience. The distribution of the stamens of *Hibbertia* into bundles is very irregular: one bundle is sometimes reduced to a single stamen only, whence the corresponding side of the flower is almost deprived of stamens, and from this modification the transition to *Pleurandra* is evident. De Candolle's sections of the genus are neither natural nor tenable on other grounds, and it is probable that the number of ovules affords the best primary sections. The stamens are either free or united into a bundle by the bases of their filaments in the same species, and even variety; and the tribe *Alyssoideæ*, characterized by the stellate pubescence, appears to be rendered nugatory by *P. ovata*, which has sometimes only simple and at other times stellate hairs; whence I suspect that different states of it are described under different names in the sections *Alyssoideæ* and *Hibbertianæ*. The connective of the anthers presents the same curious canals, charged with very long fusiform cells, that *Hibbertia ericæfolia* does: the arillus is, as in that plant, formed from the micropyle, and the embryo, which is extremely minute, is enclosed in a coarsely granular albumen. (Named from πλευρα, a side, and ανηρ, in allusion to the unilateral stamens.)

1. **Pleurandra acicularis** (Lab. Nov. Holl. ii. 6. t. 144); suffruticulus rigidus glaberrimus, ramis depressis erectisve, ramulis sulcatis gracilibus, foliis sparsis lineari-subulatis aristatis pungentibus enerviis ob marginem arctissime revolutum dorso 2-sulcatis petiolo brevissimo callo ramuli ciliato inserto rarissime sparse scaberulis setulosisve, pedunculis 1-floris axillaribus arcuatis foliis longioribus, sepalis oblongis acutis mucronatisve glabris puberulisve, staminibus 5–8, ovariis 1–2 tomentosis 2-ovulatis.—*DC. Syst.* i. 421, *Prodr.* i. 173; *Lond. Journ. Bot.* ii. 402. (*Gunn*, 611.)

HAB. Sandy land, Georgetown; Flinders' Island; sea-coast east of Port Dalrymple, *Gunn.*—(Fl. Dec.)

DISTRIB. South-eastern Australia and New South Wales.

A small, rigid, wiry, *Cyathodes*-like plant, with (in Tasmanian specimens) stout, woody, gnarled stem, and slender, twiggy, grooved branches, 2–10 inches high, and often depressed.—*Leaves* small, scattered, spreading, harsh, pungent, almost sessile, on a little ciliated protuberance of the branch; quite smooth, or with a few scattered tubercles on the upper convex surface; under surface marked with two parallel furrows, indicating the margins to be revolute and appressed. *Flowers* on slender, curved peduncles, ½ inch long (much shorter in specimens from South-eastern Australia), yellow, ½ inch diameter. *Sepals* contracted and swollen at the very base. *Petals* obcordate. *Ovaries* one or two, very small, with long styles. *Seeds* (in Australian specimens) two, with a brown testa and deeply-lobed membranous aril.

2. **Pleurandra sericea** (Br. in DC. Syst. i. 416); suffrutex erectus sericeo-villosus, ramis hirsutis, foliis sparsis confertisve lineari-oblongis obtusis marginibus interdum revolutis, costa inferne valida, floribus sessilibus, sepalis oblongis villosis marginibus scariosis, petalis profunde bifidis, staminibus 8, ovariis 2 dense appresse tomentosis 4-ovulatis.—*DC. Prodr.* i. 72. P. densiflora, *Hook. Bot. Journ.* i. 245. P. cinerea, *Br. in DC. l. c.* (*Gunn*, 636.)

Hab. Common on sandy land, on the coast only, throughout the Island. Port Dalrymple, *Col. Patterson, Lawrence, Gunn.*—(Fl. Oct. Nov.)

Distrib. South-eastern Australia.

A very distinct species, well marked by the long silky hairs on the foliage and sepals, and dense villous tomentum of the branches.—*Plants* rigid, erect, stout, 4–20 inches high. *Branches* erect, lower parts clothed with stellate pubescence, upper with long, silky, often compound, hairs. *Leaves* linear-oblong, $\frac{1}{3}$–$\frac{2}{3}$ inch long, 1–4 lines broad, blunt, generally narrow, with the margins revolute to the midrib, at times broad, with the back of the leaf exposed, and a stout broad midrib; under surface, except the midrib, covered with dense appressed tomentum, upper punctate at the base of the long hairs. *Flowers* large, $\frac{3}{4}$ inch broad, conspicuous, sessile amongst the leaves. *Petals* lobed to one-third the way down. *Stamens* about eight. *Carpels* two (one, according to DC.), densely covered with appressed down. *Ovules* four. *Seeds* two, with a deep brown testa and small-lobed aril.—Brown's *P. cinerea* appears to be a state of this, according to specimens in the British Museum.

3. **Pleurandra ovata** (Lab. Nov. Holl. ii. 5. t. 143); erecta v. decumbens, ramis ramulisque sparse pilosis pubescentibusque, foliis obovatis v. obovato-oblongis obtusis marginibus recurvis superne pilis rigidis asperis glabratisve subtus pube stellata v. simplici asperis glaberrimisve, pedicellis folio æquilongis longioribusve, sepalis late oblongis acutis dorso pubescentibus v. asperulis rarius glabratis pilosisve, petalis late obcordatis, staminibus sub-10, ovariis dense tomentosis 4-ovulatis.—*DC. Syst.* i. 418, *Prodr.* i. 72; *Hook. Bot. Journ.* i. 246.

Var. *α. prostrata;* caulibus diffusis gracilibus, foliis sparsis superne glabratis albo-punctatis parce setulosis subtus remote asperulis.—P. ovata, *Lab. l. c.* (*Gunn*, 183.)

Var. *β. scabra;* caulibus erectis suberectisve fastigiatis robustioribus, foliis superne sparse setosis subtus setulis simplicibus v. stellatis sparsis scaberulis.—P. ovata, *var.*, *Lab. l. c.* P. scabra, *Br. in DC. Syst.* i. 419. P. astrotricha, *Sieb. Plant. Exsicc. n.* 149; *Spreng. Syst.* iv. 191; *Lond. Journ. Bot.* ii. 402. (*Gunn*, 893.)

Hab. Var. *α.* Abundant in sandy soil on the coasts in various places; Huon River; Recherche Bay; Asbestos Hills, etc., *Lawrence, Gunn;* Port Arthur, *Backhouse.* Var. *β.* Flinders' Island and Westhead, Tamar River, *Gunn.*—(Fl. Oct. to Jan.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

Apparently an extremely variable plant, whose forms I have felt repeatedly inclined to separate into two species: one, the slender, prostrate, or subscandent twiggy plant, of the southern parts of the Island; the other, the stout erect shrub from Flinders' Island and the Tamar River. I however find no difference whatever in the flowers and fruit of all these varieties; the leaves vary similarly in each in form, size, and amount of scabridity and of stellate hairs on both surfaces; and amongst Australian specimens there appear to be still other states that do not accord in habit with any of the Tasmanian ones. This species breaks down the principal character upon which De Candolle founds his divisions *Alyssoideæ* and *Hibbertianæ.* Sieber's *P. parviflora* (from Sydney?) seems the same as this, and differs from Brown's species in the leaves not being tomentose below. The *P. scabra* (Br. in DC.) does not seem to differ from *ovata* except in the subglabrous calyx, and leaves subcanescent below; for I find the calyx to vary much in its hairiness, the leaves (as mentioned above) in the amount of clothing below, whilst the third character, founded on the supposed pilose ovaries, appears to me to be a misconception, all the specimens having densely-villous ovaries, which is possibly what Labillardière meant by the term pilose.

Stems 1–3 feet long or high; prostrate, slender and twiggy, with distant leaves, in var. *α*; erect, stout, and leafy, in *β*: bark red, more or less pubescent, or with a few long hairs. *Leaves* $\frac{1}{4}$–$\frac{3}{4}$ inch long, obovate or linear-obovate and spathulate, rarely linear-oblong or broadly oblong, blunt, contracted into a very short petiole: upper surface covered with more or less copious white tubercles of various sizes, from which white setæ spring; margins strongly revolute, seldom reaching the midrib below; under surface studded with innumerable orbicular stomata, giving a whitish or glaucous hue to the broader leaves, also more or less covered with scattered, simple or stellate, very short setulæ; midrib pilose. *Peduncles* slender, pubescent, as long as the leaves. *Sepals* pubescent, and more or less pilose. *Flowers* $\frac{1}{3}$–$\frac{2}{3}$ inch in diameter. *Petals* broadly obcordate, two-lobed, with a deep sinus. *Stamens* ten, often monadelphous at the base. *Carpels* two, very villous; *ovules* four in each. *Seed* half-enveloped in a large cup-shaped membranous aril.

4. **Pleurandra riparia** (Br. in DC. Syst. i. 419); erecta, decumbens v. prostrata, ramis ascendentibus erectisve gracilibus pubescentibus strigilloso-pilosis rarius glabratis, foliis sparsis linearibus obtusis lævibus scaberulisve marginibus ad costam revolutis, floribus terminalibus sessilibus v. breve pedunculatis, sepalis oblongis acuminatis glabris pubescentibus pilosisve, petalis late obcordatis, staminibus 2–8 filamentis liberis v. basi monadelphis, carpellis tomentosis 4-ovulatis.—*DC. Prodr.* i. 72; *Hook. Journ. Bot.* i. 245.

Var. *α*; caule basi decumbente v. erecto, foliis $\frac{1}{2}$-pollicaribus lævibus v. parce scaberulis, ramulis glabrioribus. (*Gunn*, 182.)

Var. *β*; caule decumbente, ramis ascendentibus, foliis $\frac{1}{3}$–$\frac{1}{2}$-pollicaribus setuloso-scaberulis, ramulis pubescentibus. (*Gunn*, 639.)

Var. *γ. stricta*; stricta, erecta, fastigiatim ramosa, foliis $\frac{1}{4}$–$\frac{1}{3}$-pollicaribus superne ramulisque scabridis cano-scaberulisve subtus glabrioribus.—P. stricta, *Br. in DC. Syst.* i. 422; *Prodr.* i. 73.

Var. *δ. microphylla*; foliis parvulis $\frac{1}{5}$–$\frac{1}{4}$-pollicaribus glabrioribus. (*Gunn*, 22.)

Hab. Abundant throughout the Island. Var. *α*. In grassy and heathy places. Var. *β*. In sterile and rocky places. Var. *γ*. Spring Bay, and sea-coast at Currie's River, *Gunn*.—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

An extremely abundant and variable plant, which I have in vain endeavoured to divide into forms distinguishable by any constant characters. I believe it to be also very common in Australia, and probably described under several names. The monadelphous filaments are certainly no character, all the forms having all, or some of them, more or less combined at the base, or quite free; and De Candolle's section *Candolleanæ*, founded on this character (and which was hence made to include the var. *stricta*), falls to the ground. The variations of the foliage of this species recall those of *Leucopogon ericoides*. Lindley's *P. incana*, from the sterile interior of South-eastern Australia, collected by Major Mitchell, appears to be a very hoary state which is also found at Port Phillip (F. Müller), and marked as a variety of *P. stricta*. Mr. Gunn warns me, that if I can find no botanical characters to distinguish the different states of this plant which he sends, I may consider them the same, for that it is one of the most variable plants in the Colony. All the varieties, he states, may be found near Georgetown.—*Stems* woody at the base, with erect or decumbent slender branches, 4 inches to 4 feet long. *Leaves* $\frac{1}{4}$–$\frac{2}{3}$ inch long, very narrow, linear, blunt; margins recurved to the midrib; above smooth and shining, or more or less scabrid, with minute setæ rising from a conical base; these are sometimes so numerous as to render the foliage hoary. *Flowers* sessile at the ends of the branches, rarely shortly pedunculate, $\frac{1}{2}$–$\frac{3}{4}$ inch across. *Stamens* usually seven. *Ovaries* two, as in *P. ovata*.

5. **Pleurandra hirsuta** (Hook. Comp. Bot. Mag. i. 273); fruticulus ramosissimus, sericeo-pilosus, ramulis gracillimis decumbentibus apicibus ascendentibus ultimis villosis, foliis sparsis parvis anguste linearibus v. elliptico-oblongis acutis marginibus (non ad costam) recurvis superne pilis laxis breviusculis mollibus (subtus dense) albo-tomentosis, floribus ramulis terminalibus v. brevibus lateralibus sessilibus, sepalis dense sericeo-tomentosis lineari-oblongis acutis, petalis obcordatis, staminibus 5–7 filamentis liberis, carpellis 2 dense tomentosis intus stellatim tomentosis 4-ovulatis. (*Gunn*, 445.)

Hab. Georgetown and Hobarton, always prostrate, amongst stones in a basaltic soil, *Backhouse, Gunn, etc.*—(Fl. Oct. Nov.) (*v. v.*)

A remarkably distinct little species, forming small, depressed, wiry, rigid, hoary tufts. *Stem* very woody at the base, with much divided, decumbent, slender, pubescent branches, and tomentose or villous branchlets. *Leaves* $\frac{1}{4}$ inch long, narrow-linear or elliptical-oblong, acute, convex above, with generally a central groove, and covered with soft, short hairs, very densely tomentose below, with appressed wool. *Flowers* small, $\frac{1}{3}$–$\frac{1}{2}$ inch broad, sessile. *Sepals* linear-oblong, acute, densely pubescent and hairy, coriaceous. *Petals* obcordate, but not deeply or broadly notched. *Stamens* few; filaments quite free. *Carpels* two, densely tomentose and villous on the surface; walls of their cavity white with dense stellate pubescence. *Ovules* four in each carpel. *Seeds* with a pale brown testa and small aril.—This is easily distinguished by its small size, hairiness, and leaves, whose margins are not revolute as far as the midrib.

Nat. Ord. V. CRUCIFERÆ.

The *Cruciferæ* of Tasmania and Australia (of which about forty species are known) are more European in character than those of South Africa; all the genera, except *Stenopetalum*, are more typical of the northern hemisphere than of the southern; and none of them present any marked deviation from the Order in habit or characters. The Tasmanian species are much more numerous than those of New Zealand, and of the natives of the latter country three are also common to Tasmania. Most of the species abound in an essential oil, and have eminently antiscorbutic properties; so many become succulent pot-herbs by culture, that experiments should be instituted to this effect with the Tasmanian species.

Gen. I. CARDAMINE, *L.*

Sepala 4, erecta v. subpatentia, basi æqualia. *Petala* 4, lamina dilatata patente. *Stamina* 6, edentula. *Stigma* capitatum. *Siliqua* bivalvis, linearis, compressa; valvis enervibus v. venis tenuibus; septo tenui. *Semina* plurima, pendula, funiculis gracilibus; *cotyledonibus* accumbentibus.

Chiefly a European and temperate North American genus, also found in both Arctic and Antarctic regions.—Slender or rarely robust, generally glabrous herbs, usually with divided leaves, that taste strongly of cress, and white or pink flowers, in terminal racemes. *Sepals* four, usually erect, rarely spreading. *Petals* with a narrow erect claw and spreading limb. *Stamens* six; filaments without teeth or notches. *Pod* compressed, two-valved, narrow linear, with elastic valves and a blunt style. *Seeds* with slender funicles. (Name from καρδια, *the heart*, and δαμαω, *to fortify*; in allusion to its stimulating properties.)

1. **Cardamine radicata** (Hook. fil. Ic. Pl. t. 882); glaberrima, robusta, foliosa, radice crassa multicipite, foliis radicalibus plurimis obovato-spathulatis obtusis grosse lobato-serratis caulinis subsessilibus, caulibus floriferis erectis brevibus fructiferis elongatis, floribus parvis albis, sepalis lineari-oblongis obtusis, petalis spathulatis, siliquis strictis erectis anguste elliptico-lanceolatis stylo breviusculo terminatis, valvis subenerviis planis, seminibus obovatis compressis impunctatis. (*Gunn*, 2027.)

Hab. Summit of Mount Olympus, in crevices of basaltic columns, elev. 5000 feet, *Gunn*.—(Fl. Jan.)

Mr. Gunn says of this curious plant, that a number of procumbent brittle branches (rhizomes) spring from one root, and bear no leaves except at their extremities.—*Rhizomes* often as thick as the finger, 6–8 inches long. *Leaves* very numerous, spreading on the rocks, 2–4 inches long, spathulate, narrowed into petioles, coarsely toothed. *Flowering stems* 2–4 inches high, very leafy. *Flowers* numerous, small, white. *Pods* $\frac{3}{4}$ inch long, narrowed at both ends, with a short style; *valves* flat; *seeds* compressed, not dotted.

2. **Cardamine stylosa** (DC. Syst. ii. 248); elata (2–4-pedalis), glaberrima, ramosa, foliis sagit-

tato-amplexicaulibus lineari-spathulatis (3–5 unc.) oblongisve integerrimis v. irregulariter dentatis, racemis elongatis, floribus parvis, siliquis 1–1½ unc. longis robustis pedicellatis horizontalibus, stylo ½–¾ unc. longo, valvis concavis obscure 3-nerviis, seminibus oblongo-obovatis turgidis grosse impresso-punctatis fusco-brunneis.—*DC. Prodr.* i. 149. Arabis gigantea, *Hook. Ic. Pl. t.* 259, *Journ. Bot.* ii. 405. (*Gunn*, 778.)

Hab. Northern and eastern coasts, near the sea; Circular Head, amongst bushes, in rich soil, and St. Mary's Pass, *Gunn.*—(Fl. Feb.)

Distrib. South-eastern Australia.

Very easily recognized by its great size, branched habit, the nearly entire leaves, with sagittate or semiamplexicaul bases; small flowers, long fruiting raceme, with horizontal robust pods, and large dark brown turgid seeds, with deeply impressed testa.

3. **Cardamine dictyosperma** (Hook. Journ. Bot. i. 246); elata, 2–3-pedalis, ramosa, glaberrima, foliis petiolatis integris lobatis v. pinnatisectis sæpius sinuato-dentatis, petiolis interdum decurrentibus, racemis multifloris, floribus majusculis, siliquis erecto-patentibus (1–1½ unc. longis), stylo gracili (½–¾ unc. longo), valvis convexis, seminibus oblongis atris profunde punctatis.

Var. *α*; floribus majoribus ⅓–½ unc. latis, foliis subintegris sinuato-dentatis. (*Gunn*, 401.)

Var. *β*; floribus ut in *α*, foliis pinnatifidis lobis sinuato-dentatis.—C. nivea, *Hook. Comp. Bot. Mag.* i. 273. (*Gunn*, 401? *et* 80.)

Var. *γ*; floribus minoribus ¼ unc. latis.

Hab. Abundant in damp ravines, and by waysides throughout the Island, *Gunn, etc.*—(Fl. Nov. to Feb.) (*v. v.*)

Distrib. South-eastern Australia.

A handsome species, with the seeds of *C. stylosa*, but erect pods.—*Stems* 1–3 feet high, much branched. *Leaves* on long petioles, spathulate, or obovate, or lanceolate-oblong, entire, toothed, sinuate, runcinate, or pinnatifid, with toothed lobes. *Flowers* generally large and milk-white, ½ inch across, sometimes much smaller. *Pods* as in *C. stylosa*, but more slender, and nearly erect, with spreading pedicels.

4. **Cardamine pratensis** (L.); erecta, glaberrima (6-unc. v. pedalis), foliis radicalibus pinnatisectis lobis sessilibus v. petiolulatis ovatis oblongis rotundatis cordatisve, caulinis superioribus in lobos anguste lineares fissis pinnatisectisve, floribus amplis lilacinis albisve, siliquis strictis erectis in stylum subulatum angustatis, valvis planis.

Var. *α. lilacina*; floribus majoribus lilacinis, caule subgracili ramoso erecto.—C. lilacina, *Hook. Comp. Bot. Mag.* i. 273 *in note.* (*Gunn*, 779.)

Var. *β. flaccida*; floribus minoribus ¼–⅓ unc. diametr., foliorum pinnulis paucioribus, caule sæpe flaccido decumbente.

Var. *γ. tenuifolia*; caule gracili flaccido, foliis omnibus pinnatisectis segmentis anguste linearibus, floribus amplis albis.—C. tenuifolia, *Hook. Journ. Bot.* i. 247. (*Gunn*, 447.)

Var. *δ. stricta*; caule stricto, foliis ut in var. *α*, floribus minoribus ¼ unc. latis.

Hab. Common in marshy and wet places throughout the Island.—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia (Swan River?); temperate and Arctic Europe and America.

A very variable plant, as Mr. Gunn truly remarks; intermediate in size, and very much in characters, between *C. dictyosperma* and *C. hirsuta*. I can find no characters, even of habit and appearance, to distinguish it from the *C. pratensis* of Europe, except the occasionally longer style, a very variable character both in this plant and in its congeners. The larger size and much larger flowers chiefly distinguish it from the following, together with the

linear lobes of the upper cauline leaves; the latter character is shared by the radical leaves of the var. *tenuifolia*. Even the different Tasmanian varieties may all be found amongst our European and Arctic forms.

5. **Cardamine hirsuta** (L.); minor, glabra v. puberula, foliis radicalibus pinnatisectis segmentis petiolulatis integris lobatisve rotundatis cordatis oblongisve, floribus parvis, siliquis acutiusculis obtusisve.

Var. *α*; erecta v. decumbens, foliolis petiolulatis subrotundis mucronatis, floribus parvis, siliquis erectis obtusis.—*Fl. Ant.* ii. 232; *Fl. N. Zeal.* i. 13. (*Gunn*, 779, 780.)

Var. *β. heterophylla*; glabra, foliis radicalibus integris cordatis cæteris pinnatisectis segmentis ovato-cordatis terminali maximo, siliquis gracillimis obtusis, stigmate sessili, floribus majusculis sæpe purpureis, petalis lineari-spathulatis.—C. heterophylla, *Hook. Comp. Bot. Mag.* i. 273, *Ic. Pl. t.* 58, *Bot. Journ.* ii. 404. (*Gunn*, 446, 780.)

Var. *γ. intermedia*; caule debili subradicante, foliis subradicalibus longe petiolatis pinnatisectis segmentis petiolulatis oblongis, floribus mediocribus albis, petalis obovato-spathulatis, siliquis gracilibus in stylum attenuatis.—C. intermedia, *Hook. Ic. Pl. t.* 258, *Bot. Journ.* ii. 404. (*Gunn*, 446?)

Var. *δ. debilis*; caulibus radicantibus gracilibus decumbentibus flaccidis, siliquis gracilibus subcorymbosis apice attenuatis, floribus minimis.—C. debilis, *Forst. Prodr.*

Var. *ε. glacialis*; caulibus brevibus foliisque subcarnosis, floribus majusculis albis, siliquis latiusculis obtusis, stigmate sessili.—C. glacialis, *DC. Syst.* ii. 264, *Prodr.* i. 153. (*Gunn*, 781, 1024.)

Hab. Throughout the Island, abundant in many localities, from the sea-shore to 4000 feet elevation.—(Fl. at all seasons.) (*v. v.*)

Distrib. South-eastern and Western Australia, New Zealand, Antarctic Islands; abundant throughout Europe, North America, in the hilly regions of the tropics, and in the Pacific Islands.

There are no limits to the variations of this protean plant; I have studied it in a thousand forms, from all parts of the globe, and vainly endeavoured to distinguish species or varieties that could be defined with tolerable precision. As with the case of all plants that are found in many climates, it displays extraordinary powers of varying in each; and when the wide differences between the climates of England and Tasmania are considered, the wonder is, not that different forms of the same species should inhabit both countries, but that exactly the same forms should occur in each. The most remarkable and only tangible differences amongst the Tasmanian specimens are the comparative breadth of the pod and length of the style; for those of habit, sizes of the flowers, form and cutting of the leaves, and number of the leaflets, etc., afford no characters at all. These differences in the pods are so great, that I have often felt inclined to class several of the varieties with *C. pratensis*, especially as coloured flowers are common amongst them; but on the whole I think it better to leave them as they are, though in a very unsatisfactory state, and to recommend the subject to the attention of the colonial botanist; meanwhile all the smaller forms of Tasmanian *Cardamine* may be provisionally referred to *C. hirsuta*. I find amongst European specimens of *C. hirsuta*, forms that are in every respect similar to the Tasmanian ones.

Gen. II. BARBAREA, *L.*

Sepala 4, æqualia, suberecta. *Petala* unguiculata, lamina explanata. *Stamina* edentula. *Siliqua* linearis, compresso-tetragona; valvis nervosis, concavis, subcarinatis. *Semina* uniseriata; *cotyledonibus* accumbentibus.—Herbæ *erectæ, foliosæ*; foliis *lyrato-pinnatifidis integrisve*; floribus *flavis*.

The few known species of this genus are confined to the north temperate and colder regions of the globe, except the following, which is common to Australia and New Zealand. One of the English species has been used as a pot-herb, and is called Winter Cress; it has a nauseous, acrid taste.—Stout, erect, leafy herbs, with broadly lyrate-pinnatifid leaves and angular stems, and racemes of yellow flowers. *Pods* erect, linear, bluntly four-angled,

with a short stout style. *Valves* strongly veined, obscurely keeled. *Seeds* numerous, in two rows in each cell. (Name from a European species having been dedicated to *St. Barbara.*)

1. **Barbarea australis** (Hook. fil. Fl. N. Zeal. i. 14); foliis inferioribus lyrato-pinnatifidis, lobis lateralibus obovato-oblongis terminali ovato sinuato, superioribus integris lobatis pinnatipartitisve, floribus majusculis, siliquis erecto-patentibus linearibus compresso-tetragonis pedicello tereti elongato latioribus, stylo brevi recto. (*Gunn*, 643, 643 ?)

Hab. Moist or marshy places in the central districts, as at Marlborough, Middlesex Plains, and St. Patrick's River, common; also found near Launceston. (*Gunn.*)—(Fl. Dec.)

Distrib. New Zealand.

I have in the 'New Zealand Flora' pointed out the differences between this and its very near ally *B. præcox* of Europe, which consist in the larger flower, broader pod, and more slender pedicel. Mr. Gunn found it originally in the wildest and most inaccessible parts of the Island, which, coupled with the fact of its not frequenting inhabited places, is good evidence of its being a native, a fact which its comparatively trifling specific difference from so common an English weed as *B. præcox* would otherwise have led me to doubt.—A tall, robust herb, eighteen inches to two feet high, with a simple, or sparingly branched, erect, leafy stem. *Leaves* extremely variable in size and division, the last lobe of the radical ones usually very large and sinuate, 2–3 inches long. *Pods* 1½ inch long. 1–1½ line broad, their pedicels 2 lines long.

Gen. III. NASTURTIUM, *Br.*

Sepala 4, patentia. *Petala* 4, limbo patente. *Stamina* edentula. *Siliqua* teretiuscula, abbreviata, curvata v. declinata. *Stigma* subbilobum. *Semina* irregulariter biseriata, emarginata; *cotyledonibus* accumbentibus.

Erect or decumbent herbs, generally pungent to the tongue; natives of various temperate and some tropical parts of the world, and including the common Water Cress.—*Leaves* usually pinnatifid. *Flowers* yellow, rarely white. *Sepals* spreading. *Pods* short, curved, inflated, with a short style; *valves* membranous; *seeds* in two rows. *Cotyledons* accumbent. (Name said to be from *nasus tortus*, a *twisted nose;* in allusion to some of the species causing sneezing.)

1. **Nasturtium terrestre** (Br. in Hort. Kew. ed. 2. iv. 110); suberecta, glabra v. pilosa, foliis integris pinnati-lobatisve auriculatis lobis confluentibus sinuato-dentatis, petalis flavis calycem æquantibus, siliquis brevibus turgidis oblique oblongis pedicellis gracilibus æquilongis in stylum brevem abrupte angustatis, seminibus plurimis.—*Engl. Bot. t.* 1747; *Fl. N. Zeal.* i. 14. N. palustre, *DC. Syst.* ii. 191.

Var. *semipinnatifidum;* foliis dentato-pinnatifidis.—N. semipinnatifidum, *Hook. Journ. Bot.* i. 246. (*Gunn*, 74.)

Hab. Abundant on wet banks of St. Patrick's River, and on the Derwent above New Norfolk, where flooded in winter, *Gunn.*—(Fl. Nov.)

Distrib. Found in the Old World from Sweden to the Mediterranean, and in the New from the coast of the Arctic Sea to Mexico; also in India, extratropical South America, New Zealand, and Tasmania. The var. *semipinnatifidum* is found in the neighbourhood of Buenos Ayres and in New Zealand.

A leafy, branching herb, with generally decumbent stems 6–18 inches long. *Leaves* usually pinnately lobed, sometimes entire, at others sinuate, or only toothed; lobes toothed. *Petals* small, yellow. *Pods* short, turgid, obliquely curved.—Brown states that the European *N. amphibium* is a native of Australia.

Gen. IV. STENOPETALUM, *Br.*

Sepala 4, erecta, basi fere æqualia. *Petala* 4, unguiculata; lamina elongata, lineari, sæpe torta. *Stamina*

edentula. *Silicula* bivalvis, lineari-oblonga v. elliptica, septo parallele compressa, valvis concavis. *Semina* biseriata, pendula, immarginata, funiculis brevibus; *cotyledonibus* incumbentibus.—Herbæ, foliis *linearibus;* floribus *racemosis, flavis purpurascentibusve.*

Slender, erect or decumbent plants, with a few linear leaves and elongated racemes of erect or nodding flowers. *Sepals* narrow, erect. *Petals* with a narrow limb, often twisted. *Pod* oblong; valves convex. *Seeds* in two rows, with short funiculi and incumbent radicle.—This genus, of which about six species are known, is quite confined to Australia, and varies greatly in habit, as also in the length of the petals, from which the generic name was derived. The species chiefly occur in the southern and western parts of that continent, one extending into Tasmania. (Name from *στενος, narrow,* and *πεταλον, a petal.*)

1. **Stenopetalum lineare** (Br. in DC. Syst. ii. 513); caule simplici v. ramoso erecto v. basi decumbente, foliis integris anguste linearibus, racemis elongatis strictis apice puberulis, floribus breviter pedicellatis erectis, sepalis anguste linearibus, siliquis anguste lineari-oblongis erectis pedicello duplo longioribus, valvis concavis, costa distincta.—*Hook. Ic. Pl. t.* 618. S. gratulatorum, *Ferd. Müller?* (*Gunn,* 1941.)

Hab. South Esk River, thirty miles from Launceston, *Gunn.*

Distrib. South-eastern and South-western Australia.

This appears to be Brown's *S. lineare* and Müller's *S. gratulatorum* of Port Adelaide in Herb. Bentham, and perhaps of Port Phillip, though the specimen of the latter in Herb. Hook. is a very much branched, robust plant, with pubescent branches. Neither Müller's Adelaide specimens (in Herb. Bentham), nor the Tasmanian ones, are as slender as that described by Brown. The leaves are both entire and somewhat pinnatifidly cut in the Port Phillip specimen, and the *replum* seems rather stronger than in the Tasmanian ones. As I have only one good example of Gunn's plant, some allowance must be made for this description, all these *Cruciferæ* being excessively variable, especially in habit, robustness, foliage, and often in comparative length of pod.—Branched from the base, a foot high; *stems* slender, rigid, with a few narrow linear, entire leaves 1 inch long. *Racemes* (fruiting) 6 inches long. *Flowers* erect, $\frac{1}{4}$ inch long, on short erect pedicels (yellow? or purplish?). *Pods* $\frac{3}{10}$ inch long, $\frac{1}{15}$ inch broad, erect, on stout erect pedicels half their own length. *Valves* concave, with a stout dorsal nerve; *septum* membranous. *Seeds* about 15–20, from the narrowness of the pod almost uniseriate, pale yellow-brown.—There is (in Herb. Hook.) an imperfect specimen, apparently of this species, from the interior of the Port Jackson Colony (A. Cunningham), with pinnatifidly cut leaves.

Gen. V. HUTCHINSIA, *Br.*

Sepala æqualia. *Petala* integra. *Stamina* edentula. *Silicula* latere compressa, oblonga v. subrotunda; *valvis* concavis, subcarinatis. *Semina* pauca v. plurima; *cotyledonibus* incumbentibus v. accumbentibus.

Generally small slender weeds, natives of Europe and subalpine regions, with pinnatifid radical leaves, erect or decumbent, simple or branched stems, and small flowers in terminal racemes.—*Sepals* 4, equal, spreading. *Petals* 4, entire. *Pod* short, laterally compressed, oblong or rounded; *style* very short; *valves* concave; *seeds* few or many, with free funiculi and incumbent or accumbent cotyledons. (Named in honour of *Miss Hutchins,* an eminent Irish botanist.)

1. **Hutchinsia procumbens** (Br. in Hort. Kew. ed. 2. iv. 82); glaberrima, caulibus e radice plurimis gracilibus diffuse ramosis ascendentibus, foliis spathulato-lanceolatis integris lobatis subpinnatifidisve, racemis fructiferis elongatis, floribus parvis, siliculis late oblongis, stylo brevi v. 0, valvis cymbiformibus reticulatis, pedicellis filiformibus, seminibus biseriatis pallidis, cotyledonibus accumbentibus.—*DC. Prodr.* i. 177; *Engl. Bot. t.* 111. Stenopetalum incisifolium, *Nob. in Hook. Ic. Plant. t.* 276. Capsella Australasica, *Ferd. Müller.* (*Gunn,* 644.)

Hab. Blackman's River, on the road to Hobarton, *Gunn.*—(Fl. Nov.)

Distrib. South-eastern and Western Australia, throughout Europe, West Asia, Africa and the Mediterranean region, Western Tibet, Afghanistan, and Patagonia.

It is difficult to suppose that this plant is wild in Tasmania and Australia, seeing that its European and Asiatic range is quite normal, and that it does not inhabit any part of the American or Australian continents, except where civilization has extended.—A slender, annual or perennial, procumbent, diffusely-branched, glabrous herb, with few leaves, and slender, often flexuous branches, a span long, running out into long fruiting racemes. *Leaves* 1 inch long, spathulate, lanceolate, entire, sinuate or pinnatifid. *Flowers* minute; *petals* white. *Capsules* small, $\frac{1}{10}$ inch long, on slender spreading pedicels $\frac{1}{4}$ inch long, terminated by very short straight styles. *Valves* obovate-oblong, reticulate, boat-shaped. *Seeds* few.

2. **Hutchinsia australis** (Hook. fil.); pusilla, pilis ramosis puberula, diffuse ramosa, foliis petiolatis lanceolatis spathulatisve varie pinnatisectis (primordialibus integris), lobulis obtusis, ramis subrobustis, floribus minimis, sepalis late oblongis, petalis late obovato-spathulatis sepalis paullo longioribus, siliculis ellipticis pedicellis strictis erecto-patentibus $\frac{1}{2}$ brevioribus, stylo brevissimo, valvis concavis reticulatis, seminibus majusculis 4–6 quovis loculo late oblongis funiculis breviusculis, cotyledonibus incumbentibus. (*Gunn*, 644.) (Tab. IV.)

Hab. Not unfrequent in stony, dry places, but easily overlooked. Macquarrie Plains, Derwent, *Miss Ballantyne, Gunn, J. D. H.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia.

An insignificant little weed, an inch to a span long, minutely hispid, or pubescent, with short branched hairs —*Stems* many, from one annual root. *Leaves* $\frac{1}{4}$–1 inch long, entire or variously cut. *Branches* rigid in fruit *Flowers* corymbose, very minute, white. *Pods* $\frac{1}{6}$ inch long, elliptical, compressed. *Valves* not so turgid as in *H. procumbens*, and seeds much larger than in that plant, orbicular-oblong, compressed, with short funicles; *testa* minutely granular, covered when moistened with a mucous secretion.—This plant was discovered, according to Mr. Gunn, by Miss Ballantyne.—Plate IV. Fig. 1, flower; 2, the same spread open; 3, petal; 4, stamen; 5, pollen; 6, ovary; 7, pod; 8, the same with the valves removed; 9, seed; 10, transverse section of ditto; 11, embryo; 12, seed moistened; 13, hairs:—*all magnified.*

Gen. VI. THLASPI, *Dillen.*

Sepala 4, suberecta. *Petala* 4, integra, lamina dilatata. *Stamina* edentula. *Silicula* latere compressa, obcordata, valvis navicularibus, carina alatis. *Semina* 2–8, immarginata. *Cotyledones* accumbentes.—Herbæ *plerumque glabræ;* foliis *radicalibus plerumque petiolatis*, caulinis *amplexicaulibus;* floribus *albis.*

The species of this genus are found in most quarters of the globe; some of the alpine ones have very wide ranges, being found within the Arctic Circle, and on the mountains of Europe, Asia, and America. One doubtful member of the genus inhabits the mountains of New Zealand, and another those of Tasmania.—The character of the European species is as follows:—Annual or perennial, generally glabrous herbs, with petioled radical leaves and amplexicaule cauline ones. *Flowers* white, racemose. *Sepals* subereet. *Petals* with an expanded limb. *Pod* short, obcordate, much compressed laterally. *Valves* boat-shaped, winged at the keel. *Seeds* 2–8 in each cell. *Cotyledons* accumbent. (Name from *θλαω, to flatten;* in allusion to the compressed pods.)

1. **Thlaspi? Tasmanicum** (Hook. sub *Hutchinsia?* Ic. Pl. t. 848); annuum, digitale, hirsutulum v. glabratum, caule subsimplici, foliis integerrimis v. obscure dentatis radicalibus petiolatis spathulatis lanceolatisve, caulinis sagittato-semiamplexicaulibus, petalis (albis) spathulatis sepalis oblongis duplo longioribus fructu immaturo obovato-obcordato, stylo columnari brevi, pedicello patente apice incrassato sessili, ovulis sub-8, funiculis curvis, valvis navicularibus. (*Gunn*, 204.)

Hab. Arthur's Lake, elev. 3000 feet, amongst moss, *Gunn.*—(Fl. Oct.)

A very distinct little plant, whose genus must remain doubtful till ripe fruit is examined. Annual, erect, 3–6 inches high, stiff, glabrous or hirsute with lax hairs.—*Stem* sometimes branched, stiff and flexuose. *Radical leaves* $\frac{1}{4}$–$\frac{1}{2}$ inch long, lanceolate, spathulate, petiolate; *cauline* linear-oblong, with sagittate bases. *Flowers* white, $\frac{1}{10}$ inch broad. *Sepals* glabrous or hairy. *Pedicels* of unripe fruit spreading, stiff, $\frac{1}{4}$ inch long. *Seeds* about 8.

Gen. VII. DRABA, *L.*

Sepala erecta. *Petala* 4, limbo explanato. *Stamina* edentula. *Silicula* subelliptica v. elliptico-oblonga, compressa; valvis convexis planiusculisve, 1-nerviis. *Semina* plurima, 2-seriata, funiculis capillaribus liberis. *Cotyledones* accumbentes.—Herbæ, foliis *integerrimis;* floribus *flavis v. albis.*

A large European genus, most abundant on the Alps and mountains of Scandinavia, Greece, and Asia Minor, also extending into the northern regions of America. Very many species are natives of the Andes, and a few are found in Fuegia, but none in New Zealand, or elsewhere in the southern regions of the Old World, except the *D. nemoralis* of Tasmania. Most of the species are tufted alpine herbs, but not the present, which is a lax-growing plant. — *Leaves* entire or toothed; radical petiolate; cauline sessile or amplexicaul. *Flowers* white or yellow, corymbose or racemose. *Sepals* four, suberect. *Petals* with an expanded limb, not bilobed. *Pod* short, elliptical-oblong or obovate, rarely linear; valves flat, or slightly convex; *septum* entire, membranous. *Seeds* numerous, with slender funiculi. *Cotyledons* accumbent. (Name from δραβη, *acrid.*)

1. **Draba nemoralis** (Linn. Sp. Pl. i. p. 643); pubescens, caulibus gracilibus parce ramosis, foliis radicalibus oblongis spathulatisve integerrimis dentatisve caulinis sessilibus latioribus dentatis, floribus albis, sepalis pilosis, siliculis suberectis obovatis v. elliptico-oblongis pedicello gracili divergente, valvis planiusculis membranaceis puberulis, septo enervi, seminibus late ovato-oblongis. — *DC. Prodr.* i. 171; *Engl. Bot. t.* 912. (*Gunn*, 1025.)

Hab. Dry places near Hobarton, and on the banks of the Derwent at the Cataracts, *Backhouse, Gunn.* —(Fl. Oct.) (*v. v.*)

Distrib. Middle and Southern Europe, Asia Minor, Soongaria; also found in Sweden, and the Northern United States.

This is undoubtedly the European *D. nemoralis*, and apparently perfectly wild in Tasmania. The specimens are small and simple, with shorter pods than in many northern forms, but quite similar to others. Annual, pubescent or pilose, 1–6 inches high, simple or branched.—*Radical leaves* oblong or spathulate, entire or toothed, $\frac{1}{2}$–1 inch long; *cauline* sessile, broader-toothed. *Flowers* minute, white. *Sepals* oblong, pilose. *Petals* spathulate. *Stamens* nearly equal. *Ovary* broadly oblong, pubescent, with a short stout style. *Pods* on slender spreading pedicels, $\frac{1}{4}$ inch long, erect, obovate or elliptical-oblong; *valves* flat, membranous, pubescent, with a slightly-raised mesial line. *Seeds* about twelve in each valve, on long slender funicles, broadly obovate-oblong. *Septum* nerveless.

Gen. VIII. LEPIDIUM, *L.*

Sepala suberecta v. patentia. *Petala* 4, integra, v. 0. *Stamina* 6 v. pauciora. *Silicula* latere compressa, ovalis, apice integra v. biloba, valvis carinato-apteris alatisve, septo angusto. *Semina* loculis solitaria, e apice septi pendula, rarius gemina. *Cotyledones* incumbentes.—Herbæ, foliis *variis;* racemis *demum elongatis;* floribus *parvis, albis, interdum imperfectis.*

A large genus, chiefly of natives of the north temperate zone, with some southern ones, most of which are maritime plants.—*Herbs*, with often suffruticose stems. *Leaves* entire, toothed, or sinuate, rarely pinnatifid. *Flowers* white, small, racemose, often imperfect; racemes elongated in fruiting. *Sepals* spreading or suberect. *Petals* four,

or none, limb entire. *Pod* laterally compressed, ovate or oblong, with a very narrow septum, entire, emarginate, or bilobed at the top. *Valves* keeled, often winged at the back. *Seeds* solitary, rarely in pairs in each cell, pendulous from the apex of the cavity. *Cotyledons* incumbent or accumbent. (Name from λεπις, *a scale*; in allusion to the form of the pods.)

1. **Lepidium cuneifolium** (DC. Syst. Veg. ii. 545); robusta, glaberrima, divaricatim ramosa, foliis cuneato-oblongis subspathulatis basi lata sensim angustata insertis (½–1 unc. longis) apicem versus grosse dentatis, racemis brevibus fructiferis 1–3-uncialibus, pedicellis divaricatis ¼-unc., siliculis rhombeo-oblongis rotundatisve emarginatis pedicello paullo brevioribus.—*DC. Prodr.* i. 206; *Hook. Journ. Bot.* ii. 406. (*Gunn*, 645.)

Hab. Coasts of various parts of the Island: Macquarrie Harbour, *A. Cunningham*; Bass Straits; Circular Head and Woolnorth, *Gunn.*—(Fl. Jan.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

A spreading, robust, perennial plant, 2 feet and more high, growing in the wash of the sea, where with a few other plants it forms the boundary of phænogamic vegetation.—*Branches* as thick as a quill, horizontal. *Leaves* cuneate-oblong or spathulate, fleshy, toothed towards the top only, ½–1 inch long, ¼–⅓ inch broad. *Racemes* 1–3 inches long. *Flowers* and fruit numerous. *Fruit* flat, nearly ¼ inch long, rhomboid-oblong or broader, notched at the tip. *Valves* not winged, but flat and keeled. *Style* very short, included in the notch.—This approaches very closely to *L. piscidium*, Forst. (Oahuense, *Cham. et Schl.*), of Australia (Flinders' Bay, Collie) and the Pacific Islands, but has shorter, smaller leaves, of a different form.

2. **Lepidium ruderale** (L. Sp. Pl. 900); caule glaberrimo v. apice puberulo basi lignoso valde ramoso, ramis gracilibus elongatis, foliis linearibus integris v. varie incisis pinnatisectisve plerumque serratis glaberrimis puberulisve, siliculis parvis oblongis emarginatis pedicello multo brevioribus, floribus imperfectis apetalis diandris.—*Engl. Bot. t.* 1595. (*Gunn*, 1026.)

Var. β. *robusta*; ramis robustioribus divaricatim ramosis, racemis brevioribus.

Hab. Common on waysides and by the sea-shore in many situations. Var. β. D'Entrecasteaux Channel, *J. D. H.*—(Fl. Sept. Oct.) (*v. v.*)

Distrib. South-eastern and Western Australia, extratropical South America, South Africa, and throughout temperate Europe and Northern Asia.

This common and widely-diffused plant is probably described under many names, but it is quite impossible to identify its numerous forms satisfactorily by their published descriptions. Mr. Gunn at one time thought that it might possibly be an introduced weed, and, from its localities at Hobarton, I was inclined to coincide with him; but we changed our opinions independently, on finding the plant to be abundant along all the coasts. As might be expected, the Tasmanian specimens, especially those that inhabit the moist atmosphere near the sea, are frequently much more luxuriant than the European ones. I particularly paid attention to this point in Tasmania, where I found small specimens growing by the roadsides to be altogether like European, but gradually on approaching the sea-coast the plants became stouter and more branched, stiffer, and with larger foliage. In shaded spots the stems lengthen very much, and often lie prostrate, with slender branches two feet long. It also varies extremely in being smooth or pubescent, and in the size and cutting of the leaves; which in seedling plants are generally pinnatipartite, and also frequently so at the base of old stems; at other times they are lobed, entire, or serrate. It is readily known from *L. cuneifolium* by its slender habit, narrow leaves, and small pods. De Candolle (quoting Desvaux' Journal) gives D'Entrecasteaux Channel as a habitat for *L. foliosum*, a plant I do not know, but which is said to have the pods almost twice as large as those of *L. piscidium*, and therefore twice as large as those of *L. cuneifolium*. I found *L. ruderale* abundantly in D'Entrecasteaux Channel.

Nat. Ord. VI. VIOLARIEÆ.

This small Natural Order is most abundant in the north temperate zone, where it is represented by the herbaceous species; these are also very plentiful on the Andes of South America, and are comparatively rare in the temperate regions of Australia, Tasmania, and New Zealand. The shrubby genera, again, of the Order are generally tropical; a few of them are however found in the south temperate zone, as *Hymenanthera, Melicytus* (in New Zealand), *Ionidium,* and *Citriobatus.* About twenty Australian *Violarieæ* are known, of which several are tropical. *Pigea* is the largest genus amongst them, containing ten species, natives of South-eastern and South-western Australia, but none of these have hitherto occurred in Tasmania.

Gen. I. VIOLA, *L.*

Sepala 5, basi producta. *Petala* 5, inæqualia, posticum basi saccatum v. calcaratum. *Stamina* 5; *antheræ* adnatæ, connectivo apice explanato, duarum anteriorum connectivis dorso in appendices intra calcar reconditos productis, rarissime nudis. *Stylus* clavatus. *Capsula* 1-locularis, 3-valvis; *seminibus* plurimis, placentis parietalibus 3 adnexis.—Herbæ, foliis *alternis v. rosulatis;* pedunculis *axillaribus, solitariis, unifloris, bibracteolatis;* floribus *interdum unisexualibus.*

The species of this genus are very variable in all parts of the world, and the Tasmanian are no less so than others. These belong to two sections, differing chiefly in habit, and not at all in generic characters.—*Perennial* herbs, rarely with shrubby stems, often tufted, with rosulate, always stipulate, leaves. *Flowers* solitary, on axillary bracteate peduncles, sometimes imperfect and unisexual. *Sepals* five, unequal, produced at the base. *Petals* five, unequal, with short claws and spreading limbs, the lower produced behind into a spur or sac. *Anthers* with flat terminal connectives, united into a tube; the two lower with the connective produced behind into spurs, which are lodged in that of the lower petal. *Ovary* one-celled, with three many-ovuled parietal placentæ. *Style* club-shaped. *Stigma* often concave. *Capsule* one-celled, three-valved, many-seeded. *Seeds* globose, with an elevated raphe, often carunculated, and a hollow apical chalaza. *Embryo* orthotropous in the axis of fleshy albumen. (Name probably from ἰον, the Greek name of the genus.)

1. **Viola hederacea** (Lab. Nov. Holl. i. 66. t. 91); stolonifera v. stolonibus abbreviatis cæspitosa, glaberrima v. pubescens, foliis longe petiolatis cuneatis reniformibus cordato-reniformibusve crenatis, stipulis ovato- v. lanceolato-subulatis integerrimis lacerisque apicibus glanduligeris, pedunculo solitario elongato medio bibracteolato unifloro, sepalis lineari-oblongis acutis basi incrassatis subproductis, petalis intus barbatis, inferiore subtus gibboso, stylo columnari basi geniculato.—*DC. Prodr.* i. 305. (*Gunn,* 95, 95?, 1942.)

Var. *α;* caule abbreviato, stolonibus elongatis, foliis reniformibus subrotundisve.—V. hederacea, *Lab. l. c.; Reichb. Hoh. Bot. t.* 110.

Var. *β. Sieberi;* caulibus stoloniferis densis, foliis cuneatis rhombeisve.—V. Sieberi, *Hook. Comp. Bot. Mag.* i. 274, *Journ. Bot.* ii. 406. V. spathulata, *Sieb. Plant. Exsicc.* 426.

Var. *γ. petiolaris;* foliis longius petiolatis cordato-reniformibus.—*DC. l. c.; Sieb. Plant. Exsicc. n.* 181.

Hab. Throughout the Island; all the states very common.—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

After a very attentive examination of all the forms of this plant in a living state, I feel convinced that they are referable to one common variable species, which grows in wet and dry, shaded and exposed, alpine and lowland situations, on pastures, roadsides, and sandy heaths. Mr. Gunn, who has sent copious specimens and full notes, comes to the same conclusion, and says that he has vainly endeavoured to limit even the varieties. The prominent differences are—(1) the perfectly glabrous and very pubescent forms, the latter frequenting drier soil; (2) the form of

foliage indicated under the varieties; (3) the size, from 1 to 6 inches, and from solitary plants to patches monopolizing many yards of soil; (4) the habit, from a stunted, densely-tufted plant, with the stolones reduced to short lateral branches from the top of the root, to a slender, straggling herb, with the stolones so long (3–5 inches) and numerous that the original plant is not distinguishable amongst the mass; (5) the size of the flowers, from 2 lines to nearly half an inch; (6) that of the fruit, the capsules being 2 lines to 4 lines long; (7) that of the stipules, from broad ovate-subulate, entire, imbricating, to linear-lanceolate, laciniated, almost leafy; the former being most abundant on the plants of a dry soil, the latter on those inhabiting wetter and shaded places.

2. **Viola betonicæfolia** (Sm. Rees' Cycl. n. 7); cæspitosa, glabra, foliis erectis oblongo- v. linear- v. cordato- v. sagittato-lanceolatis obtusis obscure crenatis, stipulis ovato- v. lanceolato-subulatis integris laciniatisve, pedunculis unifloris infra medium bibracteolatis, sepalis oblongo-lanceolatis, calcare lato brevi, stylo columnari geniculato apice conico incrassato truncato.—*DC. Prodr.* i. 294. (*Gunn*, 84.)

Hab. Common in moist, good soil, marshes, etc., throughout the Island.—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

A very pretty Violet, much more resembling its English congeners than *V. hederacea* does, extremely variable in size, from an inch to a span high.—*Leaves* elongated. *Flowers* handsome, $\frac{1}{4}$–$\frac{3}{4}$ inch broad, pale blue. *Petals* very variable in form, the lower with a short blunt pouch or spur.—This is very nearly allied to the *V. Patrinii*, DC., of India and China, but has a much shorter spur.

Gen. II. HYMENANTHERA, *Br.*

Flores regulares. *Sepala* 5. *Petala* 5, patenti-recurva, oblique imbricata. *Stamina* subsessilia, in tubum connata, connectivo in cristam producto, dorso appendiculato. *Ovarium* 1-loculare. *Stylus* brevis, bifidus, ramis intus stigmatiferis, ovulis 2 parietalibus oppositis. *Bacca* 1-locularis, 2- rarius 1-sperma. *Semina* parietibus oppositis affixa, superposita, superius horizontale, inferius pendulum; testa crustacea; albumine copioso; embryone cylindraceo; radicula hilo proxima.—Frutices *lignosi;* foliis *parvis, subcoriaceis, alternis;* stipulis *minutis;* floribus *parvis.*

The only species of this remarkable genus known to me are—(1) *H. dentata*, from New South Wales; (2) *H. latifolia*, End., of Norfolk Island; (3) *H. crassifolia*, Hook. fil., from New Zealand; and (4) the present, *H. angustifolia*, of Tasmania. The *H. Banksii* (F. Müller, MSS., from Victoria, name only) I have not seen. All form small, woody, branching shrubs, often spinous, with small, toothed or entire leaves, and minute flowers.—*Flowers* regular. *Sepals* five. *Petals* five, erect, with recurved apices. *Stamens* five, sessile, united into a tube. *Anthers* with an expanded connective, crested at the back. *Ovary* one-celled, with two opposite parietal ovules. *Berry* two-seeded.—De Candolle quotes Brown as describing the berry as two-celled; it certainly is not so in the Tasmanian and New Zealand species. (Name from *ὑμην, a membrane;* in allusion to the appendage at the back of the anther.)

1. **Hymenanthera angustifolia** (Br. in DC. Prodr. i. 315); foliis linearibus obovato- v. cuneato-linearibusve integerrimis apice rotundatis retusisve.—*Hook. Comp. to Bot. Mag.* i. 274. (*Gunn*, 459, 1945.)

Hab. Northern parts of the Island, Port Dalrymple, *Brown;* Launceston, and summit of Western Mountains, 3–4000 feet; Arthur's Lakes, and Vale of Belvoir, *Gunn.*—(Fl. Nov.)

This remarkable plant forms, near Launceston, an impenetrable thicket, 6–8 feet high, with twiggy branches, usually monopolizing patches of good rich soil (*Gunn*), whereas on the mountains it grows appressed to the rocks, and has stiff, gnarled branches.—*Bark* pale grey, papillose. *Leaves* solitary or tufted, $\frac{1}{4}$–1 inch long, linear, more or less dilated upwards, or cuneate, coriaceous, quite entire. *Flowers* minute, $\frac{1}{4}$ inch broad, nearly sessile on the branches, having very short bibracteolate pedicels. *Bracteolæ* connate. *Calyx-lobes* rounded, glaucous, with

membranous subciliated margins. *Petals* rather fleshy, twice as long as the calyx, ovate below, with broad, linear, recurved or revolute apices. *Stamens* nearly sessile, with broad connectives. *Ovary* ovoid, with a stout erect style, and short bipartite stigma of two flattened lobes. *Ovules* two, lateral, pendulous from opposite sides of the cavity of the ovary; funiculus short, inserted into the middle of the ovule, whose apex is upwards. *Berry* white, with purple marks, $\frac{1}{3}$ inch long, fleshy, one-celled. *Seeds* two, large, oblong. *Testa* thick, crustaceous, smooth, with a few hairs on its surface; outer surface dark brown, inner white. *Albumen* fleshy, in a membranous coat, pendulous from the summit of the cavity of the testa. *Embryo* three-fourths as long as the albumen; *radicle* cylindrical; *cotyledons* flat.

Nat. Ord. VII. DROSERACEÆ.

Australia pre-eminently abounds in plants of this Order, and especially the southern and western parts of the continent, whence thirty-five species have been described, besides two species of the allied Australian genus *Byblis*. Altogether about fifty Australian species are known; of these only a few are common to other parts of the globe, as *Drosera pygmæa, D. Arcturi, D. spathulata*, and *D. binata*, to New Zealand, and *D. spathulata* to the Philippine Islands. The scorpioid vernation of the flower-stem and the circinate foliage are most remarkable characters. The inflorescence indeed approaches that of *Borragineæ*, being well described by A. Gray (Gen. Plant. United States) as a reduced unilateral cyme, which sometimes (*D. binata*) forks, and bears a primary terminal flower in the fork. In the bracteate species the pedicels do not arise from the axil, but the side of the bract. The Order has been well monographed by Planchon in the 'Annales des Sciences Naturelles,' whence much of the following descriptions is taken.

Gen. I. DROSERA, *L.*

Sepala 4–5, plus minusve inter se coalita. *Petala* et *stamina* 4–5, basi calycis inserta, vel hypogyna. *Ovarium* 1-loculare; *stylo* brevissimo, 3–4-partito, v. stigmatibus 3–4 coronato; *ovulis* plurimis, placentis 3–4 parietalibus adnexis. *Capsula* 3–4-valvis. *Semina* plurima; embryone axi albuminis carnosi, tereti; radicula hilo proxima.—Herbæ, radice *fibrosa v. bulbosa;* foliis *glanduloso-pilosis, radicalibus sæpius petiolatis rosulatis;* floribus *albis purpureis v. roseis.*

Small, alternate-leaved, sometimes ternate-leaved plants, with slender stems or radical scapes.—*Roots* elongated and fibrous, or tomentose or scaly bulbs. *Stems* sometimes almost scandent, by means of the viscid glandular hairs that abound on the foliage; often giving out a purple dye. *Radical leaves* generally petiolate, often rosulate; *cauline* often peltate or lunate. *Flowers* cymose, solitary, or racemose, generally white, rarely pink or purplish. *Sepals* 4–5, coherent at the base, and sometimes higher up. *Petals* 4–5, clawed. *Stamens* 4–5, inserted at the base of the calyx. *Ovary* one-celled, with a short divided style, or sessile, radiating, often plumose stigmata. *Ovules* numerous, attached to parietal placentæ. *Capsule* 3–4-valved; valves united or free. *Seeds* attached to broad filaments on the middle of the valves; testa generally reticulated, often saccate, or drawn out into an appendage at the apex. (Name from δροσος, *dew;* in allusion to the glandular hairs.)

§ 1. *Leaves all radical. Scape one-flowered.*

1. **Drosera Arcturi** (Hook. Journ. Bot. 247); acaulis, foliis linearibus v. sursum dilatatis obtusis exauriculatis, stipulis 0, sepalis lineari-oblongis obtusis glaberrimis, petalis erectis coriaceis lineari-spathulatis obtusis coriaceis, staminibus hypogynis, stylis 3 indivisis.—*Hook. Ic. Pl. t.* 56; *Planch. in Ann. Sc. Nat. ser.* 3. ix. 189; *Fl. N. Zeal.* i. 20. (*Gunn*, 129.)

Hab. Summit of Mount Wellington, and Western Mountains, in bogs, elev. 3–4000 feet, *Lawrence, Gunn.*—(Fl. Feb.) (*v. v.*)

DISTRIB. Mountains of New Zealand.

A most distinct and beautiful species.—Three inches to a span high. *Root* a long, descending, fibrous axis, with spreading rootlets. *Leaves* 2–6 inches long, ¼ inch broad, blunt, one-nerved, covered with spreading glandular hairs. *Scape* longer than the leaves. *Flower* nearly ⅓ inch long. *Sepals* quite glabrous, linear-oblong, blunt. *Petals* one-third longer than the calyx. *Stamens* five, persistent. *Ovary* oblong, with three short styles, and globose, papillose stigmata. *Ovules* very numerous, attached to three broad linear placentæ. *Capsule* three- or four-valved.

2. **Drosera pygmæa** (DC. Prodr. i. 317); pusilla, acaulis, scapo unifloro, foliis rosulatis breve petiolatis rotundatis concavis subpeltatis marginibus dense glanduloso-ciliatis, stipulis magnis scariosis, scapis gracilibus, sepalis 4 oblongis obtusis glaberrimis, petalis calycem excedentibus, stylis ovario subgloboso longioribus, seminibus paucis magnis in placentas 3 punctiformes glomeratis.—*Planchon, l. c.* i. 289; *Fl. N. Zeal.* i. 20. (*Gunn*, 783.)

HAB. Abundant in peaty and sandy soil, along the north-west coast, from Rocky Cape to Woolnorth. *Gunn.*—(Fl. Nov. Dec.)

DISTRIB. South-eastern Australia, and northern parts of New Zealand.

This pretty little plant may be recognized at once by its diminutive size, and large scarious stipules, forming a rosette round the base of the scape; also by its tetramerous flowers.

§ 2. *Leaves all radical. Scapes many-flowered.*

3. **Drosera spathulata** (Lab. Nov. Holl. i. t. 106. f. 1); acaulis, scapigera, multiflora, foliis rosulatis spathulatis superne marginibusque glanduloso-pilosis, scapis 1–3 erectis simplicibus v. bifidis 8–15-floris, floribus breve pedicellatis, sepalis lineari-oblongis obtusis basi connatis, petalis spathulatis calyce duplo longioribus, stylis 3 bifurcatis.—*DC. Prodr.* i. 318; *Planchon, l. c.*; *Fl. N. Zeal.* i. 20. D. spathulata, *A. Cunn. Prodr.*; *Fl. N. Zeal.* i. 21. (*Gunn*, 782.)

HAB. Rocky Cape, in wet, marshy hollows, *Gunn.*—(Fl. Dec. Jan.)

DISTRIB. New South Wales and South-eastern Australia, New Zealand, and the Philippine Islands.

A very well-marked species, readily known by its rosulate spathulate leaves and many-flowered scape. The styles are bipartite, with blunt stigmata. *Capsule* obovate, shorter than the calyx; *seed* ellipsoid, with solid, minutely granulate testa.

4. **Drosera binata** (Lab. Nov. Holl. i. t. 105); acaulis, scapo multifloro, foliis longe petiolatis bipartitis laciniis lineari-ligulatis integris bifidisve glanduloso-pilosis, floribus magnis, sepalis ovatis glaberrimis ciliatisve oblongis obtusis, petalis obcordatis calyce 2–4-plo longioribus, stylis penicillatis.—*DC. Prodr.* v. 318; *Planchon, l. c.*; *Fl. N. Zeal.* i. 20. D. pedata, *Persoon, Bot. Mag. t.* 3082. D. intermedia, *A. Cunn. Prodr. l. c.* D. Cunninghamii, *Walpers, Repert.* v. 229. (*Gunn*, 646.)

HAB. Marshes, Formosa, *Lawrence;* Rocky Cape, Hampshire Hills, etc., *Gunn.*—(Fl. Dec. Feb.)

DISTRIB. New South Wales, South-eastern Australia, and New Zealand.

A very handsome plant, easily recognized by the long linear dichotomous leaves and beautiful flowers. The stipules are combined into one, which is two-nerved and crested along the back.

§ 3. *Stems leafy, terminated by racemose inflorescence. Styles* 2–3, *split into capillary segments. Capsule many-seeded.*

5. **Drosera Planchoni** (Hook. fil. in Planchon, Monog. l. c. p. 294); glanduloso-hispidula, caule filiformi elongato erecto, foliis longe petiolatis peltatim suborbiculatis ellipsoideisve, floribus 2–3 terminalibus magnis, pedicellis gracilibus flore æquilongis, sepalis obovato-oblongis obtusis ciliatis appresse villosis,

petalis obovato-cuneatis, seminibus perplurimis elongatis, testa laxa utrinque producta.—D. Menziesii, *Hook. Comp. Bot. Mag.* i. 274, *et Ic. Plant. t.* 53 (*non Br.*). (*Gunn*, 449.)

Hab. Northern coast, Rocky Cape, Georgetown, etc.; rare on the southern coasts.—(Fl. Sept.) (*v.v.*)

Distrib. South-eastern Australia, from Port Phillip to Encounter Bay.

A very beautiful plant, climbing amongst grass and bushes, to which it attaches itself by its viscid glands.—*Stems* very slender, flexuose, two feet long, as thick as a hog's bristle. *Leaves* usually ternate, on slender petioles, $\frac{1}{2}$–1 inch long; *lamina* orbicular, peltate, $\frac{1}{4}$–$\frac{1}{3}$ inch broad, fringed with long glandular hairs. *Flowers* two or three, at the top of the plant, nearly 1 inch diameter. *Pedicels* with lateral bracts. *Sepals* linear-oblong, blunt, villous, with appressed, shaggy, glandular hairs. *Petals* fugacious. *Capsule* three-valved.

6. **Drosera auriculata** (Backhouse, MSS.; Planchon, l. c. p. 95); caule erecto elongato glaberrimo simplici v. diviso, foliis radicalibus parvis, caulinis gracile petiolatis lunatis, racemo laxo 6–8-floro, floribus pedicellatis, sepalis oblongis obtusis integris v. subciliatis, petalis sepalis 3-plo longioribus obovato-obcordatis, stylis 3, seminibus scobiformibus.—*Fl. N. Zeal.* i. 21. D. petiolaris, *Sieber*, 176, *in part.* (*non Br.*) D. peltata, *Lab. Nov. Holl.* i. *t.* 106. (*Gunn*, 350.)

Hab. Throughout the Island, abundant in rocky, grassy, heathy places, etc., *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales, South-eastern Australia, and New Zealand.

Stems slender, erect, wiry, 12–18 inches high, terminating below in a bulbous root. *Radical leaves* few; *cauline* distant, all on slender petioles; lamina lunate and peltate. *Racemes* 2–4 inches long, six- to eight-flowered. *Flowers* on stout pedicels 3 lines long, pink, $\frac{1}{4}$–$\frac{1}{3}$ inch across. *Anthers* white, very variable, according to Mr. Gunn, in size and colour.

7. **Drosera peltata** (Sm. in Willd. Sp. Pl. i. 1546); caule erecto elongato simplici v. subramoso, foliis sicco nigrescentibus radicalibus reniformibus v. transverso-oblongis, caulinis peltato-lunatis, racemo elongato 5–7-floro, floribus pedicellatis, sepalis fimbriato-laceris, seminibus ellipsoideis, testa rugosa haud laxa.—*Smith, Exot. Bot.* i. *t.* 51; *Planchon, l. c.* (*Gunn*, 448.)

Hab. Throughout the Island, occasionally mixed with *D. auriculata*, but a much rarer plant, and found only in moist spots and grassy land, *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

Planchon considers the Tasmanian plant a variety of the Australian, and distinguishes it from that of Smith (as var. *Gunniana*) by the sepals being villous all over the back. It is readily distinguished from *D. auriculata* by the latter character and by the seeds. Mr. Gunn further remarks that it flowers later, is confined to grassy land, has white flowers, rounder buds, and yellow anthers.

8. **Drosera gracilis** (Hook. fil. MSS. in Planchon, l. c. p. 297); caule erecto elongato simplici, foliis sicco fulvis radicalibus transverse semicircularibus reniformibusve, caulinis peltato-lunatis, racemo laxo paucifloro, sepalis anguste lanceolatis acutis longe ciliatis versus margines villosis, seminibus cylindraceo-oblongis breviter caudatis. (*Gunn*, 784.) (Tab. V.)

Hab. Northern and mountainous districts, scarce; on moist banks of rivers, Formosa, Hampshire Hills, Arthur's Lake, elev. 3000–4000 feet, *Gunn, etc.*—(Fl. Jan. Feb.)

This species is closely allied to the preceding, but differs conspicuously in the form of the sepals and seeds, and in the foliage not turning black in drying. The flowers too are considerably smaller than those of *D. peltata*, the sepals being only $1\frac{1}{2}$ line long.—*Foliage* very red. *Flowers* pinkish.—Plate V. Fig. 1, radical, and 2, cauline leaves; 3, flower; 4, petal; 5, stamen; 6, ovary; 7, valve of capsule, with placenta and seeds; 8, seeds:—*all magnified.*

9. **Drosera foliosa** (Hook. fil. MSS. in Planchon, l. c. p. 293); humilis, caule simplici v. sæpius e basi

ramosa, foliis radicalibus transverse orbiculari-oblongis securidiformibusve, caulinis crebris (ratione plantæ majusculis) lunatis, racemis 3–4-floris, ramulis axillaribus terminalibusque continuis, sepalis ovatis ciliatis dorso appresse villosis, seminibus ellipsoideis utrinque truncatis ecaudatis, testa solida. (*Gunn*, 1027.) (Tab. VI.)

Hab. Marshy places, Formosa, Georgetown, and Lake St. Clair.—(Fl. Oct. to Dec.) (*Gunn.*)

Distrib. South-eastern Australia.

A much shorter, stouter, and more leafy plant than any other of the same section in Tasmania.—*Stems* 3–5 inches long, branching nearly from the base. *Leaves* rather crowded, radical ones with petioles an inch long, and an axe-shaped lamina; cauline lunate. *Racemes* abbreviated. *Flowers* as in *D. peltata*, large and white. *Foliage* pale green.—Plate VI. Fig. 1, flower; 2, petal; 3, stamen; 4, ovary; 5, seed; 6, longitudinal section of seed; 7, embryo:—*all magnified.*

Nat. Ord. VIII. POLYGALEÆ.

The Australian *Polygaleæ*, of which there are about twenty-five known species, are, with few exceptions, members of one endemic genus, *Comesperma:* the exceptions are three species of *Polygala*, whereof two are perhaps Indian, and one is apparently peculiar to the tropical parts of the Continent. The Order is unknown in New Zealand. Of *Comesperma* alone, about twenty-five species are known; they are pretty equably diffused throughout the extratropical parts of the continent and of Tasmania.

Gen. I. COMESPERMA, *Lab.*

Sepala 5, decidua, 2 interiora alæformia maxima. *Petala* 3, in corollam gamopetalam 3-lobam coalita, petalis lateralibus parvis, lobo medio imberbi integro v. emarginato. *Stamina* 8, plus minusve monadelpha. *Antheræ* poro dehiscentes. *Ovarium* 2-loculare, loculis 1-ovulatis, stylo curvato deciduo, stigmate bilobo. *Capsula* cuneato-spathulata, 2-valvis. *Semina* 2, apice loculi pendula, comosa, carunculata. *Embryo* axi albuminis carnosi mucilaginosi orthotropus.

Erect or climbing herbs or shrubs, often small, with entire, alternate, exstipulate leaves and panicles of irregular flowers.—*Calyx* of five deciduous sepals, two interior very large. *Petals* combined into a tripartite corolla, with the middle lobe beardless, entire or emarginate. *Stamens* eight, more or less united. *Capsule* bilocular, obcordate or spathulate. *Seeds* solitary, with a long delicate tuft of hairs. (Name from κομη, *hair*, and σπερμα, *a seed*.)

1. **Comesperma volubile** (Lab. Nov. Holl. ii. 21. t. 163); herbaceum, glabrum, volubile, foliis paucis linearibus lanceolatisve.—*DC. Prodr.* i. 334; *Hook. Comp. Bot. Mag.* i. 248; *Steetz, Plant. Preiss.* ii. 303. (*Gunn*, 147.)

Hab. Throughout the Island, abundant in a light soil, climbing over bushes, etc., *Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. Extratropical East, West, and Southern Australia, abundant.

This is one of the most beautiful and graceful plants in the Colony, well known as the "Blue creeper." It climbs four to six feet, and covers bushes with its beautiful bright pale-blue blossoms, which occasionally vary to white and lilac.—*Stems* as thick as a crow-quill, apparently climbing either to the right or left, but the first direction taken by the young stem or plumule is not known. *Leaves* scattered, acute, entire, petiolate, linear-lanceolate or oblong, ¼–1 inch long, entire. *Racemes* terminating short, axillary and lateral branches, 3–10-flowered. *Pedicels* 2–3 lines long, with a small concave bract at the base. *Flowers* variable in size (whence the var. β *micrantha*, Steetz, l. c.). *Sepals* three; outer rounded, membranous, entire, with parallel veins; two inner three times longer,

with short stalks and broad concave limbs. *Corolla* of three lobes; inner described by De Candolle as toothed, but quite entire in my specimens, galeate; lateral lobes obovate. *Capsule* linear-clavate, truncate, rounded or apiculate at the apex. *Seeds* glabrous except for the long silky beard, linear-oblong; testa green.

2. **Comesperma retusum** (Lab. Nov. Holl. ii. 22. t. 160); erectum, robustum, ramosum, foliis coriaceis obovatis lineari-oblongisve obtusis acutis mucronatisve ($\frac{1}{4}$–$\frac{3}{4}$ unc. long.), racemis terminalibus contractis, capsulis obcordato-spathulatis in stipitem elongatum contractis apice late retusis subbilobis cum apiculo, seminibus caruncula nulla.—*DC. Prodr. l. c.; Steetz, Plant. Preiss.* ii. 295. (*Gunn*, 170.)

Hab. Abundant, especially in the northern parts of the Island, from the sea to 3600 feet elev. on the Western Mountains, in a moist light soil, *Gunn, etc.*—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

A very handsome-flowered shrub, 1–3 feet high, branched from the base.—*Stem* and *branches* stout, leafy, with pale yellow-brown bark. *Leaves* very thick, $\frac{1}{4}$–1 inch long, obovate, linear or oblong, blunt, acute or rounded. *Flowers* purplish, in terminal subumbellate panicles. *Peduncles* short, with linear-oblong bracts. Outer *sepals* broadly oblong; two inner large, broadly elliptic, very concave, not suddenly contracted at the base. Inner lobe of corolla deeply concave and galeate, entire, lateral narrow. *Capsules* $\frac{1}{2}$ inch long, upper part broadly obovate or spathulate, retuse and almost two-lobed at the apex, with a central apiculus, contracted below into a narrow peduncle. *Seeds* villous as well as being clothed with long silky descending hairs.

3. **Comesperma ericinum** (DC. Prodr. i. 334); fruticosum, erectum, gracile, glaberrimum v. obscure pubescens, foliis linearibus lineari-oblongisve rarius elliptico-oblongis obtusis acutis apiculatisve marginibus recurvis revolutisve, racemis terminalibus elongatis, capsulis apice truncato trilobo v. late retusis medio apiculatis.—*Steetz, Plant. Preiss.* ii. 297. C. linariifolium, *A. Cunn. fid. F. Müller.* (*Gunn*, 647.)

Var. *α*; foliis sparsis anguste linearibus mucronatis.—C. ericinum, *DC. l. c.; Steetz, l. c.* 297.

Var. *β. acutifolia;* foliis sparsis oblongis linearibusve mucronatis.—C. acutifolium, *Steetz, l. c.* 296.

Var. *γ. latifolia;* foliis lanceolatis oblongo-lanceolatisve acutis.—C. latifolium, *Steetz, l. c.*

Hab. North coast, near the sea, and islands of Bass' Straits, on sandy soil, *Gunn.*—(Fl. Nov.)

Distrib. New South Wales and South-eastern Australia.

A slender, erect, twiggy bush, 3 feet high, very variable in habit, foliage, and size of flowers.—*Leaves* linear-elliptical or oblong, acute, obtuse, or apiculate, $\frac{1}{4}$–$\frac{3}{4}$ inch long, the shortest proportionably broader. *Racemes* terminal, elongated, few- or many-flowered. *Flowers* pale purple. *Bracts* very deciduous. *Sepals* three; outer broadly-ovate; inner very concave, oblong, suddenly contracted to a cuneate base. *Inner* lobe of corolla entire; *lateral* linear-oblong, with an obscure auricle on the side next the inner lobe. *Capsule* similar to that of *C. retusa*, but shorter. *Seeds* with a strophiolus and very long silky hairs; testa also hairy.—An exceedingly variable plant, probably common all over extratropical Australia. Gunn sends two states: one larger and taller, with larger leaves and larger flowers; the other (growing in more exposed situations) much smaller, with broader leaves, and smaller, darker-coloured flowers. The flowers and fruit of these states vary much, but the same variations occur in each. Müller's *C. linariifolium*, A.C., is the same plant, with a slight pubescence; Steetz's *acutifolium* and *latifolium* are sent by Gunn as varieties.

4. **Comesperma Calymega** (Lab. l. c. p. 23. t. 162); glaberrimum, herbaceum, erectum, e basi ramosum, ramis strictis virgatis simplicibus, foliis radicalibus (dum adsunt) majoribus elliptico-lanceolatis, caulinis sparsis lineari-lanceolatis omnibus acuminatis coriaceis, racemis ramos terminantibus elongatis multifloris, floribus breve pedicellatis, sepalis 3 exterioribus magnis oblongis obtusis interioribus 2 late ovato-rotundatis $\frac{1}{3}$ brevioribus, petalis lobo intermedio integro lateralibus longioribus linearibus acuminatis, seminibus villosis et longe lanatis, caruncula nulla.—*DC. Prodr. l. c.; Hook. Comp. Bot. Mag.* i. 274; *Steetz in Plant. Preiss.* ii. 306. C. isocalyx, *Spreng. Syst. Veg.* iii. 172 (*fid. Steetz*). (*Gunn*, 785.)

Hab. Common on sandy flats along the north shores of the Island, and in the islands of Bass' Straits, *Gunn.*—(Fl. Nov. Dec.)

Distrib. South-eastern Australia.

A very distinct and pretty little species, the only one in Tasmania, except *C. volubile;* with bright blue flowers, which sometimes vary to purple and white.—*Root* woody, sending up many ascending and erect slender branches, a span to a foot high, terminated by many-flowered conical racemes. *Leaves* scattered on the stems, $\frac{1}{4}$–1 inch long, linear or lanceolate, acuminate, the radical broader and larger. *Racemes* 2–4 inches long. *Flowers* smaller than in any of the foregoing species, on shorter pedicels. *Sepals* three; outer larger, oblong, membranous, tipped with blue; three inner membranous, bright blue, rarely white or purple, veined, rounded, concave. *Corolla* cleft to the middle; inner lobe galeate, entire; lateral elongated, acuminate, narrow, membranous, blue. *Capsule* small, $\frac{1}{3}$ inch long, less conspicuously truncate than in *C. Calymega* and *C. retusa*, obcordate at the apex, with rounded lobes and a central apiculus. *Seeds* brown, villous, and also bearded with hairs that are more flexuous and cottony, or woolly, than in the preceding species, in which they are silky.

Nat. Ord. IX. TREMANDREÆ.

A small Natural Order, comprising three genera and twenty-five to thirty species, all confined to the Australian Continent and Tasmania, and most of them belonging to the genus *Tetratheca*. Several abound in Tasmania and Eastern extratropical Australia, but the majority are found in South-western Australia; one from Endeavour River is the only tropical species known. They frequent sandy heaths or dry places, and imitate the *Ericeæ* of Europe and the Cape of Good Hope in a very marked manner.

The affinities of *Tremandreæ* are with *Polygaleæ*, as the structure of their flowers and fruit indicates: and that this is their nearest ally was first indicated by Brown. Planchon and Steetz however consider that they are more nearly allied to *Byttneriaceæ*, through *Lasiopetalum* and its allies, with which they have many points of structure in common.

Gen. 1. TETRATHECA, *Sm.*

Sepala 4–5. *Petala* 4–5, æstivatione induplicata. *Stamina* 8–10, subæqualia. *Antheræ* cylindricæ, 2–4-loculares, poro terminali dehiscentes. *Ovarium* 2-(rarius 4-)loculare, loculis 1–3-ovulatis. *Capsula* obovata, 2-locularis (rarius 4-locularis), loculicide 2-valvis. *Semina* 1–2, chalaza caruncula fungosa sæpe torta aucta. — Fruticuli *graciles;* foliis *alternis verticillatisve, estipulatis;* pedunculis *gracilibus, axillaribus.*

The Tasmanian species of this genus have long been a subject of detailed study by Mr. Gunn and myself, and the results are very unsatisfactory. I examined them first in 1838, and concluded that there were but two permanently distinct ones, *T. ciliata* and another more common form, which I divided into four varieties (Journ. Bot. p. 408). When in Tasmania Mr. Gunn and I very carefully studied living and dried specimens, and came to the conclusion that four kinds were distinguishable, of which however three could not be characterized by any trenchant characters, though they could generally be recognized when growing. Since my return from Tasmania I have twice examined the genus, taking the Tasmanian species both by themselves and in conjunction with the Australian, and find no reason to alter my original opinion, that there are no absolute characters by which to distinguish, *permanently*, more than two species: but that, in accordance with Mr. Gunn's and my own later opinion, the differences between the prevalent forms of one species admitted of its being divided into four varieties. Since the period alluded to, Mr. Gunn has detected a fifth and sixth form or species, *T. procumbens* and *T. Gunnii*. He remarks that the extreme forms retain their character with considerable constancy throughout the Island. This is, in short, one of those cases that so frequently occur in systematic

botany, which cannot be arbitrarily settled, and in which each person, in deciding for himself, will generally be guided by abstract considerations of the permanence of specific characters and of what constitutes a species. I may premise that there are no structural or organic characters in the flowers or fruit whereby to distinguish any of the four species; such characters as there are reside in habit, size, colour, form of foliage, of sepals, petals, and amount and nature of hairiness. Now, as a general rule, differences, to be of a specific nature, should be accompanied by absolutely distinctive characters, however slight, in the organs of reproduction, and these I do not find in the plants under consideration. It must be borne in mind that plants so common as these are very apt to run into stirpes and races, which preserve their characters for uncertain periods, independent of changed circumstances; and that with regard to Heath-like plants of the habit of *Tetratheca*, *Epacris*, *Leptospermum*, *Leucopogon*, *Gaultheria*, and others, this tendency to vary is extremely great. These circumstances, and the fact that every-day experience in the garden and field proves habit to be the most deceitful of all marks (both because of the different estimate each observer puts upon it, in individual cases, and because it is impossible to retain accurate impressions of habit under changed circumstances), strongly incline me to consider the *T. procumbens*, *pilosa*, and *Gunnii* as all one species.

It is to be borne in mind that the above remarks are only suggestive. I am far from saying that good and permanent characters, though undetected hitherto, will not be found for the above plants; nor would I go so far as to say that habit may not indicate these; but professing to be guided in the discrimination of species by the theory that these are creations of nature, I cannot avoid the conclusion that, as a general law, they must be marked by absolute characters of structural importance, and that habit, colour, etc., and such characters as are found to vary in all plants to a great degree, and may be modified to an unlimited extent in our gardens, are, as a general rule, never available for founding specific characters, though of the greatest value as guides in the search for these.

Steetz (Plant. Preiss. p. 212, in *note*) remarks that the number of parts of the flower in *Tetratheca* is variable, as indicated previously by Endlicher (Plant. Hügel. p. 8), but that the structure of the stamens is always remarkably constant in each species, these being two- or four-celled. The East Australian and Tasmanian species, he adds, have always tetramerous flowers and short terminal tubes to the anthers, whereas the majority of the West Australian species have anther-tubes as long as the body of the anther, and pentamerous flowers. Mr. Steetz remarks that the hairiness is the most variable of all characters, species and their individual organs being glabrous, hairy, or villous; to which I would add, that in the Tasmanian species they are sometimes glandular also. The anthers are spuriously four-celled, but perhaps really only two-celled in them all, from the absorption of the dissepiment. In *T. glandulosa* and *T. pilosa* the tubular apex of the anthers is often nearly as long as the cells; in *T. ciliata* it is shorter, and in *T. Gunnii* and *procumbens* very short indeed; but I find considerable variation in each species. (Name from τετρα, *four*, and θηκα, *a box*; from the four-celled anthers.)

1. **Tetratheca ciliata** (Lindley in Mitchell's Exped. ii. p. 206); erecta, virgata, pubescens v. glabrata, foliis ternis late rhombeo-ovatis rotundatisve superioribus ellipticis glaberrimis v. remote glanduloso-pilosis marginibus subrecurvis, floribus breve pedicellatis, sepalis ovato-lanceolatis glabris, petalis majusculis, antheris elongatis apice tubo brevi terminatis.—*Hook. Ic. Plant. t.* 268, *Journ. Bot.* ii. 408; *Schuckardt, Syn. Tremandr.* 32. (*Gunn*, 648.)

Hab. Mouth of the Tamar, on sandy heaths, etc., *Gunn.*—(Fl. Sept.)

Distrib. South-eastern Australia.

A very handsome plant, with much broader and less coriaceous leaves than any of its congeners.—*Stems* 2–3 feet high, rather straggling and weak, glabrous or pubescent, with short glandular hairs. *Leaves* in threes, remote, $\frac{1}{2}$–$\frac{3}{4}$ inch long, and often nearly as broad; margins recurved; upper surface smooth or scabrid, lower glaucous, glabrous. *Peduncles* slender, as long as the leaves or shorter, glabrous, or with a few scattered bristles. *Flowers* large, $\frac{3}{4}$–1 inch across, deep red, and very handsome.

2. **Tetratheca glandulosa** (Lab. Fl. Nov. Holl. i. 123); erecta, ramosa, dense patentim glanduloso-pilosa, foliis sparsis lanceolatis ovato-lanceolatisve grosse dentatis, floribus amplis ($\frac{3}{4}$ unc. latis),

antheris apice tubo loculis $\frac{1}{3}$ breviore terminatis.—*DC. Prodr.* i. 343; *Hook. Journ. Bot.* i. 248, ii. 408; *Schuckardt, Syn. Tremandr.* 33. (*Gunn*, 194.)

Hab. Abundant throughout the Island, on heathy plains.—(Fl. Sept. Oct.) (*v. v.*)

Distrib. Southern and eastern extratropical Australia.

Stems very much branched, forming little bushes 2–3 feet high, all parts but the petals and stamens copiously covered with spreading, glandular hairs. *Leaves* scattered, $\frac{1}{4}$–$\frac{3}{4}$ inch long, elliptical or oblong-lanceolate, acute, sharply deeply toothed, very variable in breadth. *Flowers* $\frac{1}{2}$–$\frac{3}{4}$ inch diameter, red, or rarely white. *Capsules* obovate-triangular, furrowed longitudinally on each valve; cells 1–2-seeded. *Seeds* pilose, grooved towards the septum of the valve; testa yellow-brown.—The *branches* are sometimes fasciate.—Schuckardt adds, on the authority of Kunth's Herbarium, Cape Van Diemen, in Melville Island, on the north coast of Australia, as a habitat for this species; but this is clearly a mistake.

3. **Tetratheca pilosa** (Lab. Nov. Holl. i. 95. t. 122); erecta, ramosa, patentim pilosa scaberula v. glabrata, pilis rarius glandulosis, foliis sparsis confertisve linearibus lineari-oblongisve rariusve late oblongis subtus glaucis marginibus subintegerrimis revolutis, floribus majusculis ($\frac{1}{2}$–$\frac{3}{4}$ unc.), antheris apice tubo loculis $\frac{1}{3}$ breviore terminatis.—*DC. Prodr.* i. 342; *Hook. Journ. Bot.* i. 248. T. glandulosa, *var.* pilosa, *Journ. Bot.* ii. 408; *Schuckardt, Syn. Tremandr.* 24.

Var. *α*; foliis sparsis linearibus planiusculis scabrido-pilosis. (*Gunn*, 193.)

Var. *β*; foliis sparsis ut in *α*, glabratis. (*Gunn*, 21.)

Var. *γ*; robusta, foliis subverticillatis anguste linearibus marginibus valde revolutis.

Var. *δ*; foliis late ovato-oblongis amplis subglanduloso-pilosis. (*Gunn*, 786.)

Hab. Abundant throughout the Island, in poor soil. Var. *β*. In stiff clay soil.—(Fl. Sept. Oct.) (*v. v.*)

Distrib. Southern and eastern extratropical Australia.

Chiefly distinguished from the last by a more slender habit, less dark foliage when dry, and narrow leaves, with less toothed and more revolute margins. Sometimes however, as in var. *δ*, the leaves are very broad. Mr. Gunn only considers *β* as a distinct variety, because of its more slender habit and its affecting a different soil; to me however it seems less marked than the broad-leaved var. *δ*, whose leaves are upwards of $\frac{1}{4}$ inch broad (which however seems, according to Mr. Gunn, to be directly caused by burning the bushes, a remarkable proof of the tendency to sport in the species); or than the small, robust var. *γ*, with crowded, and often whorled leaves. My own idea of these varieties is, that they are merely induced by accidental associations of colour, soil, habit, etc., and that no two persons would approach to any conformity if independently selecting them in the Island or in collections. Weak specimens of several forms are often supported by the bushes amongst which they grow. The flowers vary from deep red to white. Schuckardt has added Melville Island (North Australia) as a habitat for this as well as of *T. glandulosa*, no doubt erroneously.

4. **Tetratheca procumbens** (Gunn, MSS.); parvula, ramulis gracilibus diffusis v. procumbentibus, tota glabrata vel sparse et remote scaberulo-pilosa, foliis subverticillatis oppositis sparsisve (parvis) linearibus marginibus recurvis, floribus parvis sparsis breviter pedicellatis, ovario glanduloso-piloso, antheris brevibus poro magno.—(Tab. VII. *A.*) (*Gunn*, 217, 309, 649.)

Hab. Summit of the Western Mountains, elev. 3800 feet; also near the sea, on heathy plains, at Circular Head, etc., *Gunn*. (Fl. Dec.)

Mr. Gunn considers this a most distinct species. I never saw it alive myself; and in the dried specimens can find no absolute characters, though it has a very distinct appearance.—Whole plant scarcely a span high, consisting of very numerous, slender, procumbent or ascending stems, glabrous, or scantily covered with scattered short rigid hairs. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ inch long, narrow, linear, rigid, with the margins revolute to the costa, more or less

hispid, with very scattered bristles. *Flowers* small, $\frac{1}{4}$–$\frac{1}{3}$ inch diameter; *peduncles* much shorter than the leaves. The *capsules* are sometimes four-celled and four-valved.—Plate VII. *A.* Fig. 1, 2, leaves; 3, flower; 4, the same with the petals removed; 5, stamen; 6, transverse section of anther; 7, pollen; 8, longitudinal section of ovary; 9, ovule; 10, the same with the primine cut through; 11, two-celled, and 12, a four-celled capsule; 13, transverse section of four-celled capsule; 14, longitudinal section of capsule; 15, seed; 16, longitudinal section of ditto; 17, embryo:—*all magnified.*

5. **Tetratheca Gunnii** (Hook. fil.); ramis gracillimis elongatis diffusis prostratis glaberrimis puberulisve, foliis parvis sparsis oppositis ternisve glabratis scaberulo-pilosisve, floribus parvis breve pedicellatis, antheris brevibus obtusis poro magno.—(Tab. VII. *B.*) (*Gunn*, 1944.)

Hab. Asbestos Hills, North-west Tasmania, *Gunn.*—(Fl. Oct.)

A remarkably distinct-looking plant, but in my opinion a very doubtful species. Mr. Gunn however considered it very distinct, and called it *T. gracilis*, a name that is preoccupied by Steetz for a West Australian congener. The stems are very long (3 feet), weak, slender, diffuse, glabrous or pubescent. *Leaves* and *flowers* as in *T. procumbens*, but the stamens are very short, and the flowers usually white. Mr. Gunn remarks that it was gathered on grassy lands and serpentine rocks, and that *T. pilosa*, which grew along with it, retained a totally different habit and appearance; so that if a variety, its character cannot be wholly attributed to soil or situation.—Plate VII. *B.* Portion of a plant of *T. Gunnii*:—*nat. size.*

Nat. Ord. X. PITTOSPOREÆ.

About fifty accurately known species of this Natural Order, belonging to eleven genera, are found in Australia, which is perhaps the head-quarters of the Order. All are endemic, and most have a very narrow range. Of these, the genus *Pittosporum* is the largest, and its species frequent the east coast, and are rarer to the west and south; whereas all the other genera, especially *Marianthus* and *Cheiranthera*, are more abundant on the west and south coasts. A few species are found within the Tropics and in Tasmania. *Bursaria spinosa* appears to be common to all the extratropical coasts, including Tasmania. Endlicher (Plant. Hügel. p. 9) says that the genus *Sollya* (*Billardiera fusiformis*, Lab., of South and West Australia) is also found in Tasmania; but I know of no species from that country. Putterlich also (Plant. Preiss. p. 203) says that he has examined an authentic specimen of Labillardière's, gathered in Tasmania in January 1793. Both statements probably arise from some errors that are known to have crept into Labillardière's localities.

The affinities of *Pittosporeæ* are generally considered to be with *Polygaleæ*, to which some of the genera are evidently allied by many characters. Their exact position is however disputed, and they have by various authors been compared with *Celastrineæ*, *Rutaceæ*, and *Vitiferæ*. Lindley considers that the curious genus *Cheiranthera* allies them to *Dilleniaceæ*; but to me it rather suggests an affinity with *Tremandreæ*.

Gen. I. BILLARDIERA, *Smith.*

Sepala 5, æqualia, subulata. *Petala* in tubum apice ampliatum conniventia. *Stamina* 5, supra ovarium conniventia; *antheris* oblongis. *Ovarium* 2-loculare; *ovulis* plurimis, axi dissepimenti biseriatim affixis; *stylo* filiformi. *Bacca* 2-locularis, succulenta, cylindracea, brevis v. elongata. *Semina* plurima, pulpo nidulantia, subglobosa, angulata v. reniformia.—Frutices *scandentes.*

The graceful plants belonging to this genus are all extratropical and chiefly Eastern; about seven species are known.—Climbing, slender shrubs, with alternate, narrow, entire, exstipulate leaves and axillary pendulous yellow or purplish flowers. *Sepals* deciduous, generally small. *Petals* long and narrow, together forming a cylindrical

tube. *Stamens* five, with slender filaments. *Ovary* two-celled; *ovules* numerous, attached to the axis of the dissepiment in two rows. *Berry* cylindrical or quadrate, with blunt angles, or somewhat cordate, glabrous or villous. *Seeds* imbedded in pulp. (Named in honour of *Labillardière*, the naturalist to D'Entrecasteaux's voyage, and a celebrated botanist.)

1. **Billardiera longiflora** (Lab. Nov. Holl. t. 89); glabra, foliis (parvis) linearibus obovato-oblongisve, floribus elongatis, baccis glabris subgloboso-quadratis.—*DC. Prodr.* i. 345; *Sims, Bot. Mag.* 1507; *Hook. Comp. Bot. Mag.* i. 249. B. ovalis, *Lindl. Bot. Reg. t.* 1719. (*Gunn*, 169, 169? 310?)

Variat—*foliis* anguste linearibus oblongis lineari-oblongis obovato-oblongis ellipticisve;

—*baccis* breviter quadratis 4-lobis v. oblongo-quadratis utrinque obtusis rotundatis v. basi cordato-lobatis purpureis flavescentibusve;

—*floribus* $\frac{1}{3}$–1 unc. longis virescentibus flavis aureis stramineis et (sicco) cærulescentibus, sepalis ovato- v. subulato-lanceolatis ovatisve, petalis plus minusve contractis.

Hab. Abundant throughout the Island, in thickets, etc., ascending to 3000 feet.—(Fl. Oct. Dec.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

Climbing, 3–6 feet high, glabrous, extremely variable.—*Leaves* $\frac{1}{3}$–$1\frac{1}{2}$ inch long, linear-oblong, obovate, elliptical, and all intermediate forms. *Flowers* $\frac{1}{3}$–1 inch long, yellow-orange, more or less greenish or straw-coloured, sometimes bluish in dried specimens. *Sepals* extremely variable in form. *Berries* $\frac{1}{3}$–$\frac{2}{3}$ inch long, and proportionately broad, broadly-oblong or square, with rounded ends, or lobed at the base, generally of a fine blue colour, but sometimes greenish or yellowish, quite glabrous. *Seeds* very numerous, variable in size, compressed, having an opaque red-brown testa.—Labillardière's figure is very typical of a small-leaved state of this plant, which abounds in alpine parts of the Colony and probably also on the southern coast, whence his specimens were obtained: in more favoured climates it has larger leaves, and Mr. Gunn's cultivated specimens are very luxuriant.

2. **Billardiera mutabilis** (Salisb. Par. Lond. t. 48?); glabra v. sericeo-pilosa, foliis lineari-oblongis lanceolatis linearibusve, floribus breviusculis subcampanulatis, petalis acuminatis, baccis cylindraceis glabris.—*DC. Prodr.* i. 345; *Sims, Bot. Mag. t.* 1313?; *Hook. Bot. Journ.* i. 249; *Comp. Bot. Mag.* i. 275. (*Gunn*, 11.)

Hab. Northern parts of the Island, and at Georgetown, Launceston, etc., in a stiff clay soil; Flinders' Island, Bass' Straits, *Lawrence*, etc.—(Fl. Nov.)

Distrib. South-eastern Australia. (Cultivated in England.)

Readily distinguished from *B. longiflora* by the much larger foliage, which, as well as the young branches, is often covered with silky hairs; by the shorter, more campanulate flowers, with acuminate petals and larger sepals; and especially by the cylindrical fruit.—*Fruit* linear-oblong, cylindrical, glabrous, nearly blunt at both ends, green when ripe, rather acid. *Seeds* as in *B. longiflora*.—This differs from the plate in the 'Botanical Magazine' in the flower being yellow and not purplish: it more resembles that of *B. scandens* (tab. 801), but in that the fruit is hairy.

3. **Billardiera macrantha** (Hook. fil.); glabra v. ramulis pilosis, foliis (1–2-uncialibus) anguste lineari-oblongis, sepalis ovatis ovato-lanceolatisve, petalis elongatis lineari-spathulatis obtusis, ovariis linearibus pubescentibus. (*Gunn*, 310, 1028.)

Hab. Apparently not uncommon; Black River, Circular Head, Recherche Bay, Acheron River, and Macquarrie Harbour, *Gunn*.—(Fl. Dec.) (*v. v.*)

Mr. Gunn has sent this species several times, but never with fruit. Under the Macquarrie Harbour and Acheron River specimens he remarks, that it is undoubtedly a distinct species. On those from Recherche Bay (with the same number, 1028) he says, "collected within a few yards of where D'Entrecasteaux had his observa-

tory at Recherche Bay. *B. longiflora* is a very variable plant, and this may be only a variety of it." The latter remark implies that the specimens were gathered close to where Labillardière gathered his *B. longiflora*. To me the species seems very distinct, in the very long ($1\frac{1}{2}$–$1\frac{3}{4}$ inch) flowers, broad large sepals, long very blunt petals, and pubescent ovaries, which would apparently become lengthened into cylindrical berries; the ovary is also more distinctly two-celled than in *B. longiflora*.

Gen. II. PITTOSPORUM, *Soland.*

Sepala 5. *Petala* 5, in tubum conniventia, apicibus recurvis. *Stamina* 5. *Ovarium* 2–5-loculare. *Ovula* plurima, semiseptorum marginibus inserta. *Capsula* compressa, incomplete 2–5-locularis; *valvis* lignosis v. coriaceis. *Semina* plurima v. pauca, majuscula, in globum ope pulpo resinoso plerumque conglobata. *Embryo* minimus, in albumine duro.—Frutices *v.* arbores *plerumque erecti, ramosi;* foliis *persistentibus coriaceis.*

The maximum of this genus will probably be found to be in the Pacific Islands; upwards of a dozen Australian species are known, and there are ten in New Zealand; all form shrubs or trees, with alternate, generally coriaceous leaves.—*Flowers* pedunculated, solitary or fascicled or corymbose. *Sepals* five. *Petals* five, deciduous, forming a campanulate corolla. *Stamens* five. *Ovary* two- to five-celled, with numerous ovules. *Fruit* a dry, woody, generally two-valved, two-celled capsule. *Seeds* numerous, angular, imbedded in a viscous gum exuded from the walls of the valves. *Embryo* minute, in horny albumen. (Name from πιττα, *pitch*, and σπορος, *a seed;* in allusion to the gummy secretion surrounding the seeds.)

1. **Pittosporum bicolor** (Hook. Bot. Journ. i. 249); polymorphum, ramulis villosis, foliis plus minus coriaceis anguste linearibus v. lineari-oblongis obtusis acutis acuminatisve plus minusve crasse coriaceis marginibus valde v. vix recurvis subtus pube v. villo albido v. rufescente instructis, pedicellis tomentosis elongatis brevibusve solitariis v. corymboso-fasciculatis, floribus flavis rufescentibusve, capsulis rotundatis pubescentibus. (*Gunn*, 154, 650, 651.)

Hab. Throughout the Island, abundant in damp ravines, ascending to 4000 feet, *Cunningham, etc.*—(Fl. Oct. Dec.) (*v. v.*)

Distrib. South-eastern Australia.

One of the most variable plants in the Island, forming, in low grounds, a tree 30–40 feet high, with a trunk a foot and more in diameter, but gradually becoming a stunted scrubby bush on ascending the mountains. The changes of habit and characters on ascending are so gradual that I cannot rigidly define the varieties, of which the following are the best marked:—on low ground, branches lax, twiggy, with spreading, flat, linear-obovate or oblong leaves, $1\frac{1}{2}$–2 inches long, with slightly revolute margins and silvery-grey down beneath: on ascending, the branches become short, rigid, robust, erect, leaves densely crowded, erect, shorter, blunter, rigidly coriaceous, margins very revolute, clothed below with ferruginous silky and villous hairs.—*Flowers* in corymbs, with slender, nodding peduncles, 1 inch long, in low situations; solitary, or few together, with short rigid peduncles, in alpine places. *Peduncles* more or less villous. *Sepals* ovate, acute. *Petals* nearly $\frac{1}{2}$ inch long, yellow or reddish, with recurved apices. *Capsules* nearly globose, $\frac{1}{4}$–$\frac{1}{3}$ inch across, two-valved, two-celled. *Seeds* about ten in each valve, imbedded in a viscid oily red pulp.

Gen. III. BURSARIA, *Cav.*

Sepala 5, patentia. *Petala* 5, oblonga v. lanceolata, patentia. *Stamina* 5, patentia. *Ovarium* incomplete 2-loculare. *Ovula* pauca, semiseptorum marginibus inserta. *Stylus* brevis. *Capsula* compressa, obcordata, incomplete 2-locularis, apice loculicide 2-valvis; *valvis* 1–2-spermis. *Semina* reniformia, umbilico ventrali. *Embryo* in basi albuminis duri.—Frutices, arbusculæ, *v.* suffruticuli *inermes v. spinosi;* foliis *polymorphis.*

The *Bursariæ* are all extratropical Australian plants, of which only three or four species are known, all highly polymorphous.—Small undershrubs, shrubs, or small trees, spinous or unarmed. *Leaves* coriaceous, variable. *Flowers* corymbose. *Sepals*, *petals*, and *stamens* 5, all spreading. *Ovary* incompletely bilocular; *ovules* few, inserted on the dissepiments. *Capsule* obcordate, compressed, dehiscing at the apex. *Seeds* few. (Named from *bursa*, a pouch; in allusion to the form of the capsules.)

1. **Bursaria spinosa** (Cav. Ic. iv. t. 350); foliis late obovatis lanceolatis lineari-obovatis lineari-elongatisve apice bilobis retusis obtusis rotundatisve acutis acuminatisve subtus plus minus glaucescentibus, floribus pedunculatis subsolitariis fasciculatis v. varie in corymbos paniculasve contractos effusosve dispositis, sepalis parvis caducissimis, capsulis transverse oblongis obcordatisve apice truncato retuso.—*DC. Prodr.* i. 347; *Hook. Bot. Journ.* i. 249, *Comp. Bot. Mag.* i. 275. Itea spinosa, *Andr. Bot. Rep. t.* 314. Cyrilla spinosa, *Spreng. Nov. Pror.* 15? (*fid. DC.*) (*Gunn*, 15.)

Hab. Throughout the Island, abundant, *Cunningham, etc.*—(Fl. Nov. Jan.) (*v. v.*)

Distrib. Extratropical Eastern and Southern Australia. (Cultivated in England.)

An extremely abundant shrub or small tree, attaining 30–40 feet in height, with a trunk three feet in circumference, altering in habit, foliage, and inflorescence as it grows older, and altogether polymorphous.—*Stems* unarmed, or with short lateral branches becoming metamorphosed into pungent spines; branches glabrous or pubescent. *Leaves* $\frac{1}{4}$–$1\frac{1}{2}$ inch long, narrow or broad, linear, or oblong, or obovate, or lanceolate, broadest at the middle or towards the apex, which is rounded, entire, bifid, emarginate, acute or acuminate, under surface green or glaucous or silvery, more or less coriaceous. *Flowers* numerous, white, $\frac{1}{2}$ inch across, solitary, or generally disposed in branching panicles. *Sepals* transversely oblong or obcordate, brown, dry, coriaceous, transversely wrinkled, with a broadly notched or truncate apex. *Seeds* few, enveloped in a viscid gum.—It is difficult to conceive a more polymorphous plant than this.

2. **Bursaria procumbens** (Putterlich, Synops. Pittosp. p. 19); pusilla, procumbens, subherbacea, ramis prostratis ascendentibusve pubescentibus, foliis linearibus lineari-oblongisve obtusis acutis mucronatis aristatisve puberulis v. glabratis integerrimis v. apice lobatis dentatisve planis v. marginibus revolutis, floribus versus apices ramulorum solitariis fasciculatisve, pedicellis folio æquilongis brevioribusve rarius longioribus, sepalis petalis $\frac{1}{2}$–$\frac{1}{3}$ brevioribus, capsulis rotundato-subquadratis polyspermis, seminibus grosse rugoso-tuberculatis.—Pittosporum procumbens *et* P. nanum, *Hook. Comp. Bot. Mag.* i. 275; *Nob. in Journ. Bot.* ii. 109. Rhytidosporum procumbens *et* Stuartianum, *F. Müller, Cat. Plant. Victoria.* (*Gunn*, 151, 617.)

Hab. Common on sandy plains throughout the Island.—(Fl. Oct. Dec.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

A common and variable little weedy shrubby-stemmed plant, forming spreading procumbent patches, with stems 3–8 inches long, closely covered with leaves. Variable in size, habit, and foliage.—*Stems* and *foliage* more or less pubescent. *Leaves* coriaceous, curved, spreading or secund, $\frac{1}{4}$–$\frac{1}{3}$ inch long, linear or linear-oblong, blunt, acute, acuminate or aristate, and almost pungent, quite entire, or lobed, or trifid towards the apex. *Flowers* axillary, solitary, towards the ends of the branches, white or pink, $\frac{1}{3}$ inch across. *Sepals* subulate, half as long as the oblong or elliptic-lanceolate petals. *Ovary* oblong, two-celled, with two rows of axile ovules in each cell. *Capsule* rounded, membranous, transversely wrinkled, turgid, obscurely four-lobed, two-celled, with six to eight oblong-reniform seeds in each cell; *testa* rather coriaceous and spongy, tubercled and rugose.—F. Müller has founded a genus on the character of the seeds of this little plant; but though so different in habit from *B. spinosa*, it appears to me clearly a congener of that plant. The leaves are both entire and lobed and toothed on the same specimen, and I do not find any other character but the more toothed leaves, whereby to distinguish the *Rhytidosporum Stuartianum* of F. Müller. It does not appear to me that the *Bursaria diosmoides*, Putterlich, is the same species, as suggested by Walpers (Repert. i. 255, sub *Pittosporum nanum*).

Nat. Ord. XI. FRANKENIACEÆ.

The plants of this Order are natives of the shores of many extratropical countries, both in the Northern and Southern Hemisphere. About ten to twelve species are known, almost all belonging to the genus *Frankenia*. Six or eight are natives of the Australian coasts, chiefly the western, but their limits have not been determined; very probably one or more are European. The affinities of the Order are considered to be with *Caryophylleæ*, to which they appear allied in habit, in the scale upon the limb of the petals, and some other points. They are also allied to *Violarieæ*.

Gen. I. FRANKENIA, *L.*

Sepala 4–5, in tubum costatum coalita. *Petala* 5, unguiculata. *Stamina* 4–6, hypogyna. *Ovarium* 1-loculare, e carpidiis 2–3 formatum; *ovulis* numerosis parietalibus, funiculis elongatis. *Capsula* 2–4-valvis. *Semina* plurima, ascendentia, scabra.

Herbs or small shrubs.—*Stems* terete. *Leaves* opposite, often cuneate, whorled or fascicled, exstipulate. *Flowers* at the apices or between the forks of the branches, sessile, white or pink, rarely violet. *Sepals* four or five, erect, connate into a narrow furrowed tube, persistent. *Petals* as many, with long, narrow, erect claws and spreading limb; a scale is often placed at the base of the limb. *Stamens* four to six, hypogynous. *Filaments* slender. *Anthers* rounded. *Ovary* solitary, free, of two to four combined carpels, with as many styles (combined below), and oblong or capitate stigmata. *Ovules* many, on marginal placentæ at the junction of the carpels, which are produced towards the axis. *Capsule* one-celled, two- to four-valved. *Seeds* ascending, ovate; *testa* scabrous; *umbilicus* basal; *raphe* filiform; *chalaza* thickened. *Albumen* mealy. *Embryo* orthotropous, axile, as long as the seed; *radicle* very short; *cotyledons* ovate-oblong. (Named in honour of *John Franken*, a Professor of Medicine at Upsal.)

1. **Frankenia pauciflora** (DC. Prodr. i. 350); pubescens v. canescens, caulibus ascendentibus, ramulis erectis, foliis erectis lineari-subulatis ovato-oblongisve obtusis marginibus obscure v. ad costam revolutis basi membrana ciliata connatis, floribus pentameris, sepalis glabratis.—*Hook. Bot. Mag. t.* 2896; *Endl. Plant. Hügel.* 9. (*Gunn*, 1029.)

Hab. Circular Head; Goose Island, in Bass' Straits, *Gunn.*—(Fl. Nov.)

Distrib. Extratropical coasts of Australia. (Cultivated in England.)

I have identified this with the plant figured in the 'Botanical Magazine,' which has decidedly hoary down on the dried stems, and ciliated bases to the leaves; its flowers are larger, as might be expected in cultivated specimens. It appears a variable plant on the Australian coast, and the leaves on some of the Goose Island specimens are so oblong and expanded that it may be expected to occur with nearly plane, broad foliage.—Plants a span to a foot high, hoary with scattered pubescence. *Leaves* opposite, whorled and fascicled, $\frac{1}{4}$–$\frac{1}{2}$ inch long, coriaceous, linear, blunt, with the margins generally revolute to the midrib; when expanded the under surface is very downy. *Flowers* solitary, pentamerous. *Calyx* $\frac{1}{3}$ inch long, nearly glabrous. *Petals* $\frac{1}{2}$–$\frac{3}{4}$ inch across the tips of the opposite ones, claw shorter than the broadly-obovate erose lamina; *scale* broadly ovate, blunt. *Stamens* five, of unequal length; *anthers* broadly oblong. *Stigmata* three, linear-clavate.—Labillardière figures *F. tetrapetala* (i. t. 114) as a native of Tasmania. It much resembles a West Australian plant in its small size, densely imbricate leaves, much smaller flowers, and four petals, etc.; the leaves are hardly cuneate at the base, and the sepals are tomentose at the margin. —Mr. Gunn indeed considers the present as Labillardière's plant; and if so, the latter is very variable, for his specimens do not accord well with the figure of that author. Mr. Gunn says it almost covers those parts of Goose Island (growing a foot high) where space for any vegetation is left between the burrows of the mutton-bird (a species of petrel), and that he also saw it at Circular Head, whence however he has sent no specimens.

Nat. Ord. XII. CARYOPHYLLEÆ, *Juss.*

Of this extensive Natural Family (including *Paronychieæ*, *Alsineæ*, *Sileneæ*, and *Scleranthæ*) there are few Australian species, not more than fifteen in all. The species and genera which abound in the north temperate zone are comparatively scarce, and to a great extent unknown in the southern. Several of the species are cosmopolitan, and others so speedily follow civilization, that they have become denizens of every temperate latitude. *Colobanthus* is a peculiar southern form of the Order, though closely allied to the northern *Saginæ*. The occurrence of *Gypsophila tubulosa* in South-eastern and South-western Australia and in New Zealand, is one of the greatest anomalies I know of in geographical distribution: it is the only Australian representative of the great Suborder or Tribe *Sileneæ*, and had previously been only found in the immediate vicinity of the plain of Troy (in Asia Minor). Whether really a native of the Southern Hemisphere, or only introduced, the fact is sufficiently curious. The following are the characters of the Tasmanian Suborders.

Suborder I. Paronychieæ.—*Leaves* stipulate. Gen. I. Spergularia.

Suborder II. Scleranthieæ.—*Leaves* exstipulate. *Sepals* united into a coriaceous perianth. *Petals* 0. *Stamens* inserted in the tube of the perianth. *Fruit* an indehiscent one- or two-seeded utriculus. Gen. II. Scleranthus.

Suborder III. Alsineæ.—*Leaves* exstipulate. *Stamens* perigynous. *Ovules* numerous. *Capsule* dehiscent. Gen. III. Stellaria. Gen. IV. Colobanthus.

Besides the above, the *Polycarpon tetraphyllum* (belonging to the Suborder *Paronychieæ*) has been introduced into Tasmania (*Gunn*, 888): and the *Cerastium viscosum* (*Gunn*, 1030) (Suborder *Alsineæ*).

Gen. I. SPERGULARIA, *Pers.*

Sepala 5. *Petala* 5, breviter unguiculata. *Stamina* 3–10, annulo perigyno inserta. *Styli* 3–5. *Capsula* 3–5-valvis. *Semina* sæpe alata.—Herbæ *sæpe maritimæ;* foliis *stipulatis.*

Most of the species of this genus are European, and extremely variable in habit and characters. The only Australian one is the following, which is abundant in many parts of the world.—*Sepals* five. *Petals* five, with short claws. *Stamens* three to ten, placed on a perigynous ring; when five, alternate with the petals. *Styles* three to five. *Capsule* three- to five-valved. *Seeds* often surrounded with a membranous wing. (Named from its similarity to *Spergula.*)

1. **Spergularia rubra** (A. St. Hil. Fl. Bras. ii. p. 178); caulibus glabris pubescentibusve decumbentibus ramosis, foliis linearibus acutis subcarnosis, stipulis ovatis fissis, sepalis lanceolatis marginibus membranaceis, petalis roseis, seminibus compressis marginibus interdum alatis.—*Torrey et Gray, Fl. N. Am.* i. 175. S. rupestris, *Cambess. in St. Hil. l. c. t.* 110.

Var. *β.* elongata, *Fenzl. Plant. Hügel.* 9.—Arenaria rubra, *var.* media, *et* A. marina, *Linn.* A. Canadensis, *Pers. Synops.* A. marginata, *DC. Flor. Franc.* iv. 793, *Prodr.* i. 401. A. media, *L., Fl. N. Zeal.* i. 26; *Fl. Ant.* ii. 250. A. marina, *Engl. Bot. t.* 938; *Nob. in Lond. Journ. Bot.* ii. 412. (*Gunn*, 652.)

Hab. Var. *β.* Sea-coast, Circular Head, Launceston, and D'Entrecasteaux Channel, etc.; abundant.—(Fl. Dec.) (*v. v.*)

Distrib. Europe (temperate), North and South America, Asia, Australia, New Zealand, etc.

I have followed Torrey and Gray in considering the *S. marina* a variety of *rubra*, feeling satisfied that the opinion of two such admirable botanists, who have specially studied these species in all their forms, should not be put aside without such grounds as I cannot advance in favour of an opposite opinion. I have repeatedly examined

specimens of these plants from all parts of the globe, and have always felt inclined to regard them as representing two forms of one species: one of these, larger, more fleshy, and pubescent, which abounds on coasts, is the *A. marina*, Smith, the var. β of Torrey and Gray, and the Tasmanian plant; the other is a more slender, glabrous plant, with more erect branches, found in many countries distant from the sea; it is a native of Australia, but has not been hitherto found in Tasmania. The character of the seeds being winged or not is, as Chamisso and Torrey and Gray remark, of no specific value, both forms occurring in one capsule. It is, as might be expected, a very variable plant.—*Stems* decumbent, 3–8 inches long, abundantly dichotomously branched, pubescent or glabrous. *Leaves* very variable in length, fleshy, ¼–1 inch long, linear, acute; stipules ovate, cleft, membranous. *Sepals* lanceolate, with a broad white margin. *Petals* red, as long as or shorter than the sepals. *Seeds* in Tasmanian specimens with a broad white membranous margin.

Gen. II. SCLERANTHUS, *L.*

Perianthium 4–5-fidum, coriaceum. *Stamina* 1–10, tubo perianthii inserta. *Styli* 2. *Semina* pauca. —Herbæ *dense cæspitosæ.*—Mniarum, *Forst.*

A genus consisting of a few small, tufted, rigid, wiry herbs, natives of Europe, North Asia, Australia, and New Zealand.—*Leaves* opposite, connate at their bases, subulate, almost pungent. *Flowers* minute, sessile or peduncled, solitary or few together, sometimes on peduncles which elongate when fruiting. *Perianth* very coriaceous, inconspicuous, green, urceolate or tubular, 4–5-fid, with erect lobes. *Stamens* one to three, inserted on the tube of the perianth. *Ovary* one-celled, with one to two ovules pendulous from erect funiculi. *Utriculus* membranous, one-seeded. (Name from *σκληρος, hard,* and *ανθος, a flower.*)

1. **Scleranthus biflorus** (Hook. fil. Fl. N. Zeal. i. 74); dense cæspitosus, floribus geminis quadrifidis monandris pedunculo communi post anthesin elongato per paria sessilibus basi 2-bracteolatis, foliis integerrimis serrulatisve.—Mniarum biflorum, *Forst. Gen.* i. *t.* 1; *Brown, Prodr.* 412; *DC. Prodr.* iii. 378. M. pedunculatum, *Lab. Nov. Holl.* i. 8. *t.* 2. Ditoca muscosa, *Banks in Gærtner, Sem.* ii. 196. *t.* 126. *f.* 1. (*Gunn,* 1115.)

Hab. Common on dry, grassy pastures, on stones, etc.—(Fl. Oct. Dec.) (*v. v.*)

Distrib. New Zealand and South-eastern Australia.

A small, densely-tufted, rigid, moss-like herb, with rigid, subulate, pungent leaves, 2–5 lines long, more or less serrulate, especially towards the base.—*Flowers* generally two together, on short peduncles, which lengthen much after flowering. *Stamen* one.

2. **Scleranthus fasciculatus** (Hook. fil.); caule procumbente fastigiato, foliis longitudinaliter denticulatis, pedunculis fructiferis brevissimis.—Mniarum fasciculatum, *Br. Prodr.* 412; *Hook. Ic. Pl. t.* 283. (*Gunn,* 1116, 1114.)

Hab. Frequent, especially in mountainous situations, as at Formosa, Lake Echo, Arthur's Lakes, etc., *Gunn.*—(Fl. Jan.) (*v. v.*)

I am far from being convinced that this will prove permanently distinct from *S. biflorus;* its only character lies in the very short peduncles, especially of the fruit. The leaves of both vary in amount of serrature.

3. **Scleranthus diander** (Br. Prodr. 412); dense fastigiatim ramosus, foliis subulatis marginibus carinaque lævibus serrulatisve, floribus 4–5-meris ad apices ramulorum fasciculatis, staminibus 2 filamentis interjectis. (*Gunn,* 97.)

Hab. On dry banks, pastures, etc., Launceston, *Gunn.*—(Fl. Dec.)

Distrib. New South Wales.

A more robust species than either of the preceding, with leaves quite entire, or serrulate along both the margins and keel.—*Flowers* clustered at the tips of the branches, four- or five-cleft. *Stamens* two, alternating with filaments.

Gen. III. STELLARIA, *L.*

Sepala 4–5. *Petala* 4–5 (rarius 0), bifida v. bipartita. *Stamina* 8–10, disco lobato inserta. *Ovula* columna centrali inserta. *Stigmata* 2–5. *Capsula* polysperma, valvis 4–10 dehiscens. *Semina* testa granulata.

A genus very extensively diffused through the north temperate and arctic zone; also found on the mountains of various other parts of the globe.—*Herbaceous*, opposite-leaved, coriaceous or flaccid plants, often tufted, slender, and straggling herbs. *Sepals* four or five. *Petals* four or five (rarely none), bifid or bipartite. *Disc* lobed. *Stamens* eight to ten. *Ovules* inserted on a central column. *Stigmas* three, rarely two or five. *Capsule* many-seeded, bursting by twice as many valves as there are styles. *Seeds* with a granular testa. (Name from *stella*, a star; in allusion to the spreading flowers.)

1. **Stellaria multiflora** (Hook. Comp. Bot. Mag. i. 275); cæspitosa, glaberrima, apetala, caulibus perplurimis ascendentibus suberectisve basi repentibus crassiusculis, foliis parvis (1–2 lin. longis) oblongis linearibusve acuminatis subulatisve in petiolum brevem angustatis, floribus majusculis in omni nodo solitariis axillaribus sessilibus v. pedunculatis, sepalis subulato-lanceolatis acuminatis, staminibus 6–10, capsula ovato-globosa sepalis æquilonga ad medium 6-valvi, seminibus 2–6 magnis grosse tuberculatis.—*Vob. in Lond. Journ. Bot.* ii. 411. (*Gunn*, 451, 652.)

Hab. Common on grassy, dry pastures, and on rocks, etc.; on granite rocks in St. Patrick's River, elev. 2000 feet, *Gunn.*—(Fl. Oct. Nov.) (*v. v.*)

Distrib. South-western Australia and New Zealand?

A perfectly glabrous species, rather shining, flaccid.—*Stems* 2–8 inches long, spreading, decumbent or suberect, dichotomously branched. *Leaves* subulate, 1–2 lines long. *Flowers* large for the size of the plant, about as long as the leaves, very numerous, solitary in the axils of the leaves, sessile or pedicelled. *Sepals* five or six, lanceolate, acuminate, three-nerved. *Petals* none. *Stamens* small, inserted in a narrow, lobed disc, variable in number. *Ovary* oblong, with three short styles. *Capsule* as long as the sepals, deeply six-valved. *Seeds* two to six, large for the size of the capsule, red-brown, tubercled.—In the New Zealand Flora I alluded to a very small state of this (that collected on granite rocks in St. Patrick's River), under the *S. elatinoides* of that Island: but on re-examination am rather inclined to refer it to *S. multiflora*, from which it differs only in size and in the habit, which is no doubt induced by the locality.

2. **Stellaria media** (Smith, Engl. Bot. t. 537), var. *flaccida;* caule elongato debili ramoso nitido parce biseriatim piloso v. glabrato, foliis ovato-lanceolatis acutissimis ciliatis inferioribus præcipue in petiolum brevem attenuatis, pedicellis axillaribus solitariis foliis triplo longioribus, petalis bipartitis, sepalis glabris pilosisve 1–3-nerviis marginibus albidis longioribus.—S. flaccida, *Hook. Comp. Bot. Mag.* ii. 275; *Vob. in Lond. Journ. Bot.* ii. 411. (*Gunn*, 450.)

Hab. Var. *flaccida*. In dense thickets and in shaded places generally, Launceston, Circular Head, etc., *Gunn.*—(Fl. Nov. Dec.)

Distrib. Europe and North Asia, Southern and Eastern Australia, Auckland and Campbell's Island; also found in temperate North and South America, but in most places perhaps introduced.

After a very careful comparison of this with extensive suites of European, North Asiatic, etc., specimens of *S. media*, I am convinced that it is absolutely identical with some forms of that plant, though its leaves are narrower than in the commoner states, and the bifarious line of hairs less distinct: the latter is however a very variable character. I find both in European and Tasmanian specimens, that the seeds vary greatly in size, and in the length of the prominent tubercles with which they are covered. The sepals of the Tasmanian (and English) specimens are smooth or ciliated, and the stamens vary from five to ten.—*Stems* weak, loosely tufted, or trailing, 6 inches to

1½ foot long, loosely dichotomously branched, flaccid, shining, pilose with flaccid white hairs, which are more or less evidently disposed in opposite rows, which alternate on the successive internodes. *Leaves* ovate-lanceolate, acuminate, more or less petioled, ½–1½ inch long, ciliated at the base, when dry covered with minute white points. *Pedicels* horizontal, more or less deflexed in fruit, 1–3 inches long, solitary, axillary, one-flowered. *Sepals* ovate-lanceolate, acuminate. *Petals* white, bipartite (sometimes absent in European individuals). *Capsules* very variable in size.—This plant has been used as a pot-herb in England, and is the common Chickweed, a favourite food of birds. It is distributed over the whole globe, rapidly following man, and though undoubtedly wild in Tasmania, I wonder that the introduced state has not been sent home: the latter generally becomes, through cultivation, shorter, more pilose, with much larger, broader leaves, and comparatively smaller flowers.

3. **Stellaria glauca** (With. Bot. Arrang. i. 420); gracilis, debilis, caule glaberrimo, foliis remotis lineari-subulato-lanceolatis glaberrimis v. margine incrassato minutissime scaberulis, pedicellis solitariis axillaribus foliis multoties longioribus, petalis bipartitis sepala ovato-lanceolata acuminata glabra 3-nervia æquantibus v. superantibus.—*Engl. Bot. t.* 825; *DC. Prodr.* i. 397. S. palustris, *Retz. Prodr. ed.* 2. *n.* 548. S. graminea, *var.* glauca, *Linn. Sp. Pl.* S. angustifolia, *Hook. Bot. Journ.* i. 250. (*Gunn*, 238.)

Var.? *β. cæspitosa;* caulibus brevioribus cæspitosis, foliis brevioribus, sepalis ovatis acutis obtusisve.—S. cæspitosa, *Hook. fil. Lond. Journ. Bot.* ii. 411. (*Gunn*, 652, 652?)

Hab. Formosa, in marshes, *Lawrence, Gunn.*—Var. *β.* Marshes, Oatlands, Epping Forest, and Circular Head, *Gunn.*—(Fl. Dec.)

Distrib. New South Wales, temperate and colder Europe, and Northern Asia; probably also in North America, though under slightly different forms, and with, consequently, different names.

Mr. Gunn's specimens appear to be absolutely identical with English ones; the leaves are however narrower than in some English and continental forms of the species. In the description of *S. angustifolia*, the leaves are described as serrulate in the original specimens, a character I do not find to be constant nor apparent in specimens sent since by Gunn; there are however sometimes a very few scaberulous points on their thickened margins, and I find the same in British specimens of *S. glauca*. The flowers vary extremely in size in the British plant, from ⅓–¾ inch, and in the relative size of sepals and petals.—*Stems* slender, 6 inches to 1 foot long, glabrous, shining, with scattered pairs of subulate-lanceolate leaves 1–1½ inch long. *Flowers* ⅓–½ inch across, on long, slender, spreading pedicels. *Sepals* five, ovate-lanceolate, acuminate, with three nerves, and white, glabrous, scarious margins. *Petals* generally longer than the sepals.

The var. *β* I have referred here with some hesitation. There are no European or North Asiatic specimens of *S. glauca* like it in Herb. Hook., but it precisely accords with some states of *S. longipes*, Goldie, which is probably a North American form of *S. glauca*. *S. longipes* is described (Torrey and Gray, Fl. N. Am. i. 184) as extremely variable, and very abundant in an immense number of localities and over a wide range of country. Some of these varieties have blunt, and others acute sepals; some short stems, and others long. If we are to consider the typical state to be that first described as *S. longipes*, it is remarkable for its long peduncles and short stems; but these characters are only applicable to that one state, which is certainly not the usual one, if the extensive suite of specimens from many localities in the Hookerian Herbarium can be considered as affording any evidence of the common form of the species.

4. **Stellaria pungens** (Brongn. in Duperrey, Voy. Bot. t. 78); cæspitosa, suberecta v. decumbens, ramis elongatis angulatis tenuiter alatis scaberulis pilosis tomentosisve, foliis squarrosis patenti-recurvis late subulatis acuminato-pungentibus glaberrimis nitidis, pedunculis 1-floris terminalibus lateralibusque brevibus elongatisque sepalis lanceolato-subulatis pungentibus multicostatis, petalis profunde bifidis sepalis æquilongis, stylis capillaribus. — *Bot. Journ.* ii. 411. S. squarrosa, *Hook. in Bot. Journ.* i. 250. (*Gunn*, 96.)

Hab. Common in rich and poor, moist and dry soils.—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

A very different species from any of the above, extremely variable in size and habit, from a small, tufted, depressed plant, with stems and branches ½–2 inches long, to a lax, subscandent, robust herb, with stems 3 and even 5 feet high, scrambling amongst bushes, etc.—*Stems* four-angled, almost winged, glabrous, scabrid, pilose or tomentose. *Leaves* ¼–⅔ inch long, subulate, lanceolate, patent-recurved, acuminate, pungent, generally glossy. *Flowers* sessile amongst the leaves, on short or long, stout, erect, smooth or hairy pedicels, ⅓–½ inch in diameter. *Sepals* subulate-lanceolate, pungent, grooved, as long as or longer than the deeply bifid white petals.

Gen. IV. COLOBANTHUS, *Fenzl.*

Sepala 4–5, herbacea. *Petala* 0. *Stamina* 4–5, disco perigyno inserta. *Styli* 4–5. *Capsula* 4–5-valvis, polysperma.—Herbæ *cæspitosæ;* foliis *plerisque subulatis;* floribus *inconspicuis, viridibus.*

Tufted Antarctic, American, New Zealand, and Tasmanian herbs, of which few species are known.—*Leaves* generally subulate, densely crowded. *Flowers* terminal, sessile or pedunculed, green. *Sepals* four or five, erect, herbaceous. *Petals* none. *Stamens* four or five, inserted in a perigynous disc. *Ovary* one-celled, with many basal ovules, and four or five styles. *Capsule* with four or five valves and numerous seeds. (Named from *κολοβοω, to mutilate,* and *ανθος, a flower;* in allusion to the want of petals.)

1. **Colobanthus Billardieri** (Fenzl, Ann. Vienn. Mus. i. 48); acaulis, cæspitosus, foliis gramineis rigidis curvis setacco-elongatis trigonis superne canaliculatis basi late vaginatis, pedunculis elongatis foliis longioribus abbreviatisve, floribus 5-meris, sepalis capsulam superantibus.—*Fl. Ant.* i. 14; *Fl. N. Zeal.* i. 27. Spergula apetala, *Lab. Fl. N. Holl.* i. *t.* 182; *DC. Prodr.* i. 395. (*Gunn,* 966, 966?)

Hab. Northern and central parts of the Island: Circular Head, Woolnorth, Arthur's Lakes, etc., on sandy soil, *Gunn.*—(Fl. Nov.)

Distrib. New Zealand and Campbell's Island.

A small, densely tufted, grassy-leaved plant.—*Stems* scarcely any, or very short. *Leaves* springing from the root, rigid, curved, ½–1½ inch long, triquetrous, subulate, broadly sheathing at the base. *Peduncles* solitary, erect, variable in length, thickened below the flower, which is erect, 1½–2 lines long. *Sepals* ovate-subulate, acuminate, erect, coriaceous, green, much longer than the five-valved capsule.

2. **Colobanthus affinis** (Hook. fil. Journ. Bot. ii. 410); omnia *C. Billardieri,* sed sepalis acuminatis capsula multo brevioribus.—*Hook. Ic. Pl. t.* 266. (*Gunn,* 967.)

Hab. Alpine districts: Hampshire Hills and Franklin River, *Gunn.*—(Fl. Jan. Feb.)

Very similar to the preceding, of which it is possibly a variety, but the leaves are longer and more flexuose, the flowers smaller, and the sepals much shorter than the ripe capsule.

Nat. Ord. XIII. LINEÆ.

The *Lineæ,* almost all included in the genus *Linum,* abound in the north temperate zone. Planchon has discussed the affinities of the *Lineæ* at length, and thrown much light upon them by the examination of some new and curious tropical genera of the Order; through these he allies them to *Erythroxyleæ, Turneraceæ, Sauvagesieæ, Frankeniaceæ, Passifloreæ, Humiriaceæ, Hypericineæ,* and *Ternstræmiaceæ,* etc., as well as to *Elatineæ,* with which they have more obvious affinities; in fact, many of these supposed affinities must be regarded as founded on analogy, and, though not all to be rejected, I am inclined to agree with Asa Gray, who says (Gen. Pl. N. Am. ii. 105) "that on the whole, the light thrown by Planchon on the affinities of the Order does not invalidate De Candolle's remarks, that the Order is about equally allied to *Caryophylleæ, Elatineæ, Malvaceæ,* and *Geraniaceæ* (or *Oxalideæ*)."

Gen. I. LINUM, *C. Bauh.*

Flores 5-meri. *Sepala* indivisa. *Petala* nuda.

Upwards of eighty species have been described of this genus by Dr. Planchon in his excellent paper on the Order *Lineæ* (in the Lond. Journ. Bot. vi., vii.). These are chiefly natives of Europe, Southern and Eastern Asia, and a few are sprinkled over various parts of the globe, but the genus is unknown in humid tropical countries, where it is replaced by some other genera of the Order. Only two Australian species are known. No attempt has, that I am aware, been made to extract flax from the Tasmanian species, though the trial is worth making. The genus is known by its pentamerous flowers, and free, simple sepals, convolute fugacious petals, ten stamens, of which five are imperfect, with adnate glands at the back of the filament on the disc. *Capsule* with the cells spuriously completely or incompletely two-celled. (Name from the Latin *linum*.)

1. **Linum marginale** (A. Cunn. MSS.; Planch. in Hook. Lond. Journ. Bot. 1848, vii. 169); perenne, glaberrimum, caulibus apice ramosis, foliis linearibus anguste lanceolatisve, floribus subcorymbosis erectis, sepalis ovatis acuminatis integerrimis albo-marginatis capsula parva acuminata brevioribus æquilongisve, stylis supra medium connatis.—L. gracile, *Sm. MSS.* L. angustifolium, *DC. Prodr.* i. 426 (*quoad Stirp. Austral.*) *non Huds.*; *Bartling in Plant. Preiss.* i. 161; *Journ. Bot.* i. 250. ii. 410; *Comp. Bot. Mag.* i. 275. (*Gunn*, 71.)

Hab. Abundant throughout the Colony, *Lawrence, etc.*—(Fl. Oct.) (*v. v.*)

Distrib. Throughout extratropical Australia.

Planchon has well indicated the characters that distinguish this from its very near ally, *L. angustifolium*, with which it had always been confounded; and of these the united styles is by much the most important. Gunn says of it, that it is truly indigenous, and extremely abundant everywhere, varying extremely in size and habit. On the summit of the Western Mountains, at an elevation of 3000–4000 feet, the plants he collected were all small, and had white (never blue) flowers.—*Stems* few or many from the root, 6–24 inches high, branched above. *Leaves* scattered, linear or lanceolate, $\frac{1}{3}$–$1\frac{1}{2}$ inch long, $\frac{1}{8}$–$\frac{1}{6}$ wide. *Flowers* subcorymbose, alternate on the branches of the corymb, on erect pedicels, $\frac{1}{2}$–1 inch diameter, blue or white. *Sepals* much acuminated. *Stigmas* linear-elongated. *Capsule* size of a small pea.

Nat. Ord. XIV. ELATINEÆ.

The affinities of *Elatineæ* are with *Hypericaceæ* and *Caryophylleæ*, perhaps also with *Crassulaceæ*, through the curious genus *Diamorpha*, as indicated by Fenzl, and assented to by Asa Gray. Very few species are known, and these are chiefly natives of Europe, North America, and India.

Gen. I. ELATINE, *Linn.*

Sepala 2–5. *Petala* 2–5, imbricata. *Stamina* hypogyna. *Ovarium* depressum, 1–5-loculare, v. septis evanidis 1-loculare. *Ovula* plurima, placentis axillaribus affixa, stylis brevibus. *Capsula* membranacea, septifraga. *Semina* plurima, cylindracea, longitudinaliter striata et transverse rugosa.—Herbæ *aquaticæ, cellulares*; foliis *oppositis*; stipulis *interpetiolaribus utrinque binis*.

A widely distributed genus of water-plants, containing six or eight species allied to the *E. Americana*, and which together have been included in the genus *Crypta*, Nutt., distinguished by its dimerous or trimerous flowers, evanescent dissepiments to the seeds, succulent habit, and entire leaves.—*Flowers* axillary, sessile or peduncled, inconspicuous, minute. *Sepals* and *petals* two to five. *Stamens* hypogynous. *Ovary* one- to four-celled, with axile ovules,

and free short styles. *Capsule* one- to four-celled. *Seeds* crowded, linear, striated and rugose. (Name of doubtful derivation.)

1. **Elatine Americana** (Arnott in Ed. Journ. Sc. i. 130); pusilla, repens, glaberrima, caule crassiusculo, foliis obtusis brevissime petiolatis, floribus axillaribus sessilibus trimeris, capsula 3-valvi, dissepimentis evanidis, seminibus leviter curvis.—*Torrey et Gray, Fl. N. Am.* i. 203; *Fl. Nov. Zeal.* i. 27. (*Gunn*, 2010, 2016, 2012.)

Var. *α*; caule procumbente, foliis parvis ovatis oblongis rotundatisve.

Var. *β. Callitriche*; caule suberecto elongato, foliis ovato-lanceolatis sessilibus retusis.

Hab. Marshes in the northern and central parts of the Island, creeping over mud. Var. *β*. Partially floating in deeper water. Arthur's Lakes, Georgetown, Penquite, etc.—(Fl. Jan.)

Distrib. Swan River. New Zealand. North America, New York to Maryland, etc.; Oregon to New Mexico.

I have again subjected this plant to a close examination and comparison with the American specimen of *E. Americana*, but without finding any specific characters between them. The dissepiments in the ovary of both are sometimes present, and even in ripe fruit of the American specimens, which have usually fewer seeds than the Australian. The var. *β* strongly resembles a *Callitriche* in habit, and is unlike the common state of the plant, but it varies extremely in Tasmania, and I have examined a suite of curious forms from Swan River, amongst none of which are there any characters in the flowers or seeds, but much difference in the foliage and habit, which vary extremely in all water-plants.—*Stems* one to several inches long, terete, cellular. *Leaves* ¼–½ inch long, 1 inch in var. *β*, opposite, sessile, membranous, with obscure pellucid glands, of all forms, from rotundate, oblong-ovate, obovate-lanceolate, entire, blunt or retuse; *stipules* in pairs between each pair of leaves, inserted rather above the latter, each leaf slightly overlapping the edge of the stipule next to it. *Flowers* sessile, inconspicuous, white or pink.

Nat. Ord. XV. MALVACEÆ.

Australia is remarkable for the few genera and species of *Malvaceæ* which it possesses; that Natural Order seeming to be replaced by *Büttneriaceæ*, to a very striking degree. About eighty species are however known, chiefly of the tropical and subtropical genera *Hibiscus*, *Sida*, and *Abutilon*, though several species, especially of the two latter genera, extend to South-eastern Australia. The Order is eminently a tropical one.

Gen. I. LAVATERA, *L.*

Involucellum 3–6-fidum. *Calyx* 5-fidus. *Columna staminea* simplex. *Carpella* 5 v. plura, verticillata; *ovulo* solitario; *stylis* longitudinaliter intus stigmatosis.

The only Australian species of this genus is confined to the south coast and Tasmania; its congeners, of which there are several, are chiefly European and Asiatic, one or two only being natives of the Cape of Good Hope. It is readily distinguished by the involucre surrounding the calyx. (Named in honour of the *Lavaters*, physicians and naturalists, of Zurich.)

1. **Lavatera plebeja** (Sims, Bot. Mag. t. 2269); stellatim tomentosa, foliis rotundatis 5–7-lobis crenato-dentatis, pedunculis axillaribus solitariis fasciculatisve, petalis obcuneato-cordatis.—*DC. Prodr.* i. 139. L. plebeja, *β* tomentosa, *Journ. Bot.* ii. 412. (*Gunn*, 655.)

Hab. Near the sea, Woolnorth, and Trefoil Island, Bass' Straits, *Gunn*.—(Fl. Nov.)

Distrib. South coast of Australia, from King George's Sound to Port Phillip; east coast to west of the Blue Mountains. (Cultivated in England.)

Stems 2 feet high, branched, covered, as well as the leaves more or less on both surfaces, with soft stellate hairs and pubescence. *Leaves* petiolate, orbicular, five- to seven-lobed, margins irregularly toothed or crenate, 1½–4 inches broad. *Flowers* pedicelled, solitary or fascicled, white or pink, 1½–2 inches in diameter. *Involucre* three-lobed, ovate, acute, and as well as the five-lobed calyx enlarging after flowering, and hence varying much in relative size and form. *Petals* broadly obcuneate, deeply notched, with sharp lobes. *Carpels* six to eight, with a flat dorsum and sharp angled sides, wrinkled.—My specimens seem identical with the figure in the 'Botanical Magazine,' but are more tomentose than the description; this however is a very variable character, and cultivated plants are often more glabrous than the wild state. I had, in the 'Journal of Botany,' made var. *β tomentosa* of the Tasmanian specimens; but at that time I did not entertain the opinion I now do as to the impropriety of treating the cultivated plant as the typical form, and describing the wild state from which it deviated as a variety of it. According to Sims, Mr. Brown considered his south coast specimens to be specifically distinct from the one then cultivated, the seeds of which were brought from the westward of the Blue Mountains, but I am unable to distinguish Gunn's plant from Sims' figure.

Gen. II. LAWRENCIA, *Hook.*

Involucellum 0. *Calyx* subinflatus, 5-fidus. *Corolla* 5-loba, cum tubo stamineo cohærens, calyce æquilonga. *Antheræ* 8–12. *Carpella* 5, 1–2-ovulata; *stylis* totidem, filiformibus. *Eructus* 3–5-coccus; *coccis* 1–2-spermis.—Herbæ *robustæ v.* suffrutices; floribus *axillaribus spicatisve, viridibus, bracteatis.*

A very remarkable genus, unlike its allies in habit and texture, and confined to Southern and Western Australia and Tasmania. Three or four species are known, belonging to two sections; one section including the Swan River *L. glomerata*, Hook., and Tasmanian *L. spicata*, Hook., has glabrous herbaceous stems, densely spiked or axillary solitary flowers, and one-ovuled carpels; the other (*Halothamnos*, F. Müller, consisting of natives of South-eastern and South-western Australia) has shrubby stems, scaly foliage, axillary crowded flowers, and one or two ovules. Asa Gray (Bot. U. S. Expl. Exp. 180 *in note*) proposes to alter this name (by an anagram) to *Wrencialia*, because of its being too near *Laurencia*, a genus of *Algæ*. (*Lawrencia* was named in honour of *William Lawrence, Esq.*, of Tasmania, one of the earliest and most successful explorers of the Colonial Flora.)

1. **Lawrencia spicata** (Hook. Ic. Pl. t. 261, 262); glaberrima, herbacea, caulibus simplicibus erectis, foliis ovali-spathulatis inæqualiter serratis inferioribus longe petiolatis, floribus sessilibus in spicam longam densam bracteatam arctissime congestis.—*Lond. Journ. Bot.* ii. 413; *Nees v. Esenbeck in Plant. Preiss.* xi. 235. (*Gunn*, 746.)

Hab. Flinders' Island, Bass' Straits, *Gunn*. Kelvedon, Great Swan Port, *Backhouse*.—(Fl. Dec.)

Distrib. Southern and Western Australia, from Port Fairy to Swan River; Sydney?

A stout fleshy herb, with simple stems, 1–2 feet high, as thick as the thumb and woody at the base.—*Radical* leaves 1 inch long, on petioles 1–3 inches long, elliptical, coarsely irregularly serrate; upper narrower, more sessile. *Stipules* minute, subulate. *Flowers* green, the lower sessile in the axils of bracteal leaves, the upper crowded into an elongated green cylindrical spike 4–10 inches long, hidden by the lanceolate bracteal leaves, and subtended by a trifid bract. *Calyx* shorter than the bract, inflated, five-lobed above the middle. *Petals* inserted below the middle of the staminal tube, lanceolate, with obliquely bifid or truncate apices, shorter than the calyx. *Anthers* large, on short filaments at the apex of the tube. *Ovaries* one-ovuled, with long free styles, dilated into linear flat stigmata, papillose on the inner surface. *Carpels* rather membranous. *Testa* minutely cancellate. *Albumen* scanty, fleshy. *Embryo* bent at an angle; *radicle* terete; *cotyledons* convolute.—Mr. Gunn informs me that the Port Arthur station formerly assigned to this plant by him (Lond. Journ. Bot.) is doubtful.

Gen. III. PLAGIANTHUS, *Forst.*

Flores polygamo-dioici. *Calyx* campanulatus, 5-lobus, valvatus. *Petala* 5, basi in tubum coalita.

Stamina plurima; *filamentis* liberis v. basi in tubum apice pentadelphum coalitis; *antheris* 2-lobis, 1-locularibus. *Ovarium* 1–5-loculare; *ovulis* solitariis; *stylis* 1–5, basi coalitis, stigmatibus obtusis intus glandulosis. *Capsula* 1–3-cocca; *coccis* irregulariter dehiscentibus, 1-spermis. *Semen* pendulum. *Embryo* curvatus.—Frutices *v.* arbusculæ *stellato-pubescentes, interdum dioici*; cortice *tenaci*; foliis *alternis*, stipulis *parvis*.—Asterotrichum, *Klotzsch.* Blepharanthemum, *Endl.* Sidæ *sp., Hook. etc.*

A small genus, confined to New Zealand, South Australia, and Tasmania, very nearly allied to *Sida*, but differing in the form of the carpels and stigmata, as also in the anthers being incompletely two-celled, on which latter account it is placed in another Natural Order: there is indeed an imperfect dissepiment between the cells of the anther in several species, which is torn at a considerable period before the dehiscence of the lobes.—*Shrubs* with tough bark and stellate pubescence, sometimes dioecious. *Flowers* in axillary racemes, rarely solitary, white. *Calyx* five-lobed. *Corolla* membranous, very small in the female flowers of some species. *Petals* five, oblique, united at the base into a tube, that carries the staminal column. *Stamens* numerous; *filaments* united below, free above, or pentadelphous. *Ovary* of one to five carpels; *styles* united below, free above, with a blunt and dilated stigma. *Capsule* of as many one-seeded cocci, generally bursting irregularly, and separating from a central column. (Name from πλαγιος, *oblique;* in allusion to the unequal-sided petals.)

1. **Plagianthus pulchellus** (A. Gray, in Bot. U. S. Expl. Voy. i. 181); ramulis foliisque subtus stellatim pubescentibus glabratisve, foliis longe petiolatis anguste ovato-cordatis basi profunde bilobis integris v. obscure trilobis grosse crenatis, floribus masc. racemosis, fœmin. dense congestis, carpellis 4–5 deciduis.—Sida pulchella, *Bonpl. in DC. Prodr.* i. 460; *Hook. Journ. Bot.* i. 250, ii. 412. (*Gunn*, 173.)

Var. β; tomentosa, calyce molliter stellato-pubescente, stylis elongatis.—Sida Tasmanica, *Hf. in Hook. Journ. Bot.* ii. 412. (*Gunn*, 653.)

Hab. Abundant throughout the Island, in rich alluvial soil. Var. β. Campbell Town, etc.—(Fl. Oct. Nov.) (*v. v.*)

Distrib. South-eastern Australia. Var. β. Macquarrie River, *Cunningham.*

A shrub 5–9 feet high, with slender stems and branches, covered with dark-coloured bark, the foliage, branches, and inflorescence more or less covered with stellate pubescence, sometimes almost glabrous, at others very woolly or even white with soft down.—*Leaves* 1–3 inches long, on petioles of equal length, narrow ovate-cordate, with deeply two-lobed cordate bases, strongly crenate margins, and slender points, often quite glabrous above, and nearly so beneath; rarely obscurely three-lobed, sometimes (in var. β) softly downy on both sides. *Male* flowers in drooping axillary racemes, which are shorter than the leaves, on short pedicels; *females* smaller, crowded in short irregular spikes, or densely aggregated into masses. *Calyx* broadly campanulate, five-lobed, varying from almost glabrous to very densely woolly. *Petals* five, narrow oblong, or obovate-oblong, rounded at the tip, white, 2–3 lines long. *Staminal tube* erect, four- to six-lobed at the top. *Anthers* glabrous or setose, especially in the female flowers of var. β. *Ovaries* five, villous, one-ovuled. *Stigmas* elongate, linear-clavate, blunt, glandular down the inner face. *Fruit* ⅕ inch in diameter, four- or five-lobed, of as many carpels, which separate from a central persistent column, densely pubescent, one-seeded, dehiscing along the dorsum. *Seed* with a brown, smooth, coriaceous testa.—I was for some time inclined to retain the var. β as a distinct species, but after a very careful comparison of many specimens, I have been obliged to reduce it. Mr. Gunn sends it at one time as a different species and at another as a variety of *P. pulchellus*. The pubescent and even woolly leaves and calyx afford no constant character; and the styles, which are usually longer and more slender, vary so much with age, and in different individuals, that I am unable to attach specific value to their variations.

2. **Plagianthus sidoides** (Hook. Bot. Mag. t. 3396); molliter stellatim tomentosus, foliis linearioblongis breve petiolatis grosse obtuse serratis superne reticulatis subtus cano-tomentosis, racemis masculis suberectis brevibus, fœmineis brevioribus, carpellis 2 persistentibus.—*Hook. Journ. Bot.* ii. 164, *Comp.*

Bot. Mag. i. 275. P. Lampenii, *Lindl. in Bot. Reg.* xxiv. 22. Sida discolor, *Hook. Journ. Bot.* i. 250. (*Gunn*, 452.)

Hab. Common in the southern parts of the Island, in a rich soil, growing in ravines, *Fraser*, etc.—(Fl. March, Oct.) (*v. v.*) Native name, "Currajong." (Cultivated in England.)

A tree or large shrub 10–12 feet high, strictly diœcious, and both sexes flowering (according to Mr. Gunn) at two seasons.—*Bark* full of strong fibres, used as cordage. *Stems*, *leaves*, and *inflorescence* more or less pubescent or tomentose. *Leaves* on short petioles, 2–5 inches long, narrow oblong or oblong-lanceolate, coarsely crenate, rigid in consistence when dry, rugose above, with minute impressed veins, white and woolly below. *Male* flowers on nearly erect racemes, white, drooping, on short pedicels. *Calyx* broadly campanulate, five-lobed. *Corolla* very variable in size, $\frac{1}{6}$–$\frac{1}{3}$ inch diameter; *lobes* obovate-oblong, stellate-pubescent. *Pistil* columnar; *styles* united. *Female* flowers smaller, on shorter racemes, with longer tubular calyces, and smaller densely woolly corollas. *Ovaries* two, combined, one-ovuled. *Styles* two, more or less combined below, very pilose above; stigmata very short, papillose on the inner surface, blunt. *Fruit* membranous, pubescent, included in the calyx, two-celled, one cell with an imperfect seed, the other with a perfect one, similar to that of *P. pulchellus*.—This species differs very much from *P. pulchellus* in the two-celled fruit, whose carpels are attached by broad faces, and do not fall away from a central column; the fruit is also enclosed in the tubular calyx, and the corolla is also persistent in fruit.

Nat. Ord. XVI. BÜTTNERIACEÆ.

Nearly one hundred species of this Natural Family occur in Australia, of which most are confined to the south-western coasts. There are however a considerable number of eastern extratropical species, and some tropical ones. Amongst the latter are several plants that are found in many distant parts of the torrid zone, as *Waltheria Indica* and *Melochia corchorifolia*. The typical Australian genera have very narrow geographical limits, and the rarity of the Order in Tasmania is remarkable.

Gen. I. LASIOPETALUM, *Sm.*

Calyx persistens, 5-partitus, subpetaloideus. *Petala* 5, minima. *Stamina* 5, petalis opposita; *filamentis* liberis; *antheris* elongatis, extrorsis, apice poro v. rima brevi dehiscentibus. *Ovarium* 1–4-loculare, ovulis 1–2 ascendentibus. *Stylus* subulatus; stigmate simplici v. trifido. *Capsula* calyce inclusa, loculicide 2–4-valvis. *Semina* solitaria, testa puberula, strophiolo digitato v. lobato; *albumen* carnosum; *embryo* orthotropus.—Frutices *stellatim tomentosi, exstipulati;* inflorescentia *cymosa, oppositifolia*, bracteis *hypocalycinis sæpe trifidis.*

Shrubs, always densely covered with woolly stellate pubescence; all natives of Australia, south of the Tropics; not very numerous in species.—*Flowers* in dense cymes, each with a bract beneath the calyx. *Calyx* five-lobed, large, generally petaloid between the lobes. *Petals* minute, or none. *Stamens* five, opposite the petals, with short, free filaments, inserted in front of long, narrow anthers, that burst by short slits or pores at the apex. *Ovary* one- to four-celled, with one style, and a simple or lobed stigma; ovules ascending, one or more in each cell. *Fruit* enclosed in the calyx, of two to four united carpels, that split down the dorsum. *Seed* solitary, erect, with a hairy testa. (Name from λασιος, *wool*, and πεταλον; from the woolly calyx.)

1. **Lasiopetalum discolor** (Hook. Comp. Bot. Mag. i. 276); foliis breve petiolatis deltoideo-cordatis obtusis supra pubescentibus subtus albo-tomentosis, cymis densifloris pedunculatis, bracteis 3-partitis flore longioribus dense villosis, calycibus albo-tomentosis profunde 5-partitis lobis ovato-lanceolatis, ovario dense villoso, stylo gracili glaberrimo.—*Hook. Journ. Bot.* ii. 414. (*Gunn*, 551.)

Hab. Bass' Straits, Prime Seal Island, *Backhouse, Gunn.* (Fl. Sept.)

Densely pubescent.—*Leaves* 1½–2 inches long, triangular-cordate, rather truncate at the base, very blunt, white below, with stout nerves, margins waved; *petiole* ½ inch long. *Flowers* capitate, on very short pedicels; peduncle as long as the petiole. *Bract* much larger than the flower, deeply three-lobed to the base, white with ferruginous down at the base of each lobe, middle segment much the longest. *Calyx* campanulate, ¼ inch long, densely villous externally, bluish internally; lobes ovate-lanceolate. *Petals* obovate, small. *Stamens* longer than the ovary, with filiform filaments and slender anthers opening by terminal pores, their membranous apex bilobed parallel to the loculi, outer lobe spreading. *Ovary* very villous, with white hairs. *Style* slender, quite glabrous, with a minute three-lobed stigma. *Fruit* not seen.—This appears to be almost identical with a Swan River plant, but that has rather longer peduncles to the cymes; and considering how distant the countries are, and how few species are common to both, I hesitate to unite them without better data than I possess.

2. **Lasiopetalum Gunnii** (Steetz in Plant. Preiss. ii. 342); foliis ovato- v. lineari-oblongis late deltoideo-ovatisve basi truncatis cordato-bilobisve superne glabris subtus albo-tomentosis junioribus rufescentibus, cymis breve pedunculatis paucifloris, stylo basi hispido.—L. dasyphyllum, *Sieb.*, var. *β. Hook. fil. in Journ. Bot.* ii. 414. (*Gunn*, 551 *in part. et* 1032.)

Hab. Rocky Cape, and islands in Bass' Straits, in shingle close to the sea, *Gunn.*—(Fl. Dec. Feb.)

A small shrub in Tasmania, which Gunn found only where it was extremely stunted by the violent sea winds, owing to which the tops of the Banksias, and other plants amongst which it grew, appeared as if they had been cut off with a scythe.—Whole plant coarser and more robust than *L. discolor*, covered with rufous or tawny-brown wool when dry, the young leaves and shoots with often a ferruginous or ochreous, sometimes red, pubescence. *Leaves* 1–5 inches long, varying from triangular-ovate to linear-oblong, cordate-bilobed or truncate at the base, often deflexed, margins not crisped or waved, under surface generally white. *Cymes* on very short peduncles, six- to twenty-flowered. *Flowers* crowded, shortly pedicelled, ⅓ inch diameter, densely tomentose with ferruginous down. *Bracts* tripartite, lobes narrow, variable in length, seldom longer than the flower. *Calyx* hemispherical, lobes ovate-oblong, densely stellate-pubescent. *Petals* minute, obovate. *Stamens* shorter than the ovary, with short filaments, and linear anthers, with extrorse slits and minute terminal pores (empty of pollen in my specimens). *Ovary* spherical, densely covered with stellate hairs, three- or four-celled; ovules two, collateral, ascending. *Style* simple, densely hairy below, suddenly contracted, glabrous and subulate, with three or four minute stigmata. *Seed* solitary in each cell, erect, oblong, with a bilobed arillus and pilose brown testa.

This plant appears to me to be diœcious, and none of its flowers have polleniferous anthers. I should not have ventured to separate it from *L. dasyphyllum*, but for the opinion of Steetz, who appears to have better specimens of Sieber's plant than I have. Of the distinctive characters between them which he points out, the hispid base of the style is the only important one; the size and shape of the leaves, amount and colour of tomentum, size of the flowers and their tomentum, are all as variable as possible in this species and its allies, as any good series of specimens proves. The ovary and capsule are often five-celled.

3. **Lasiopetalum micranthum** (Hook. fil.); foliis breve petiolatis anguste linearibus subacutis marginibus recurvis subtus dense albo-tomentosis, cymis paucifloris, floribus pedicellatis paucis, bracteæ lobis latis flore brevioribus, calycis laciniis subulato-lanceolatis acuminatis, pilis dorso simplicibus, petalis minimis, antheris brevibus longitudinaliter dehiscentibus, stylo basi glabro. (*Gunn*, 1033.)

Hab. Eastern Tier, near Oyster Bay, and on hills thirty-five miles south-east of Launceston, *Gunn.*

A small erect species, whose anthers dehiscing by longitudinal slits perhaps ally it to the genus *Guichenotia*, Gay, but which in all other respects agrees with *Lasiopetalum*. It is very nearly allied to the *L. parviflorum* (Rudge in Linn. Soc. Trans. x. 297. t. 19. f. 2), but the petals are far more acute and the filaments are longer.—*Branches* slender. *Leaves* 1–2 inches long, linear, with recurved margins, glabrous above, white with stellate tomentum below, subacute, blunt at the base, on short petioles. *Cymes* small, on slender peduncles ¼–½ inch long. *Flowers* few, pedicelled. *Bract* three-lobed, lobes spreading, shorter than the calyx, obovate-oblong, blunt. *Calyx* ⅕ inch

long, campanulate, divided to the base; lobes lanceolate-subulate, acuminate; margins with stellate pubescence, back with simple clavate hairs. *Stamens* five, with minute petaloid glands at their base, longer than the ovary; filaments filiform, curved. *Anthers* short, oblong, extrorse; loculi completely two-valved. *Ovary* villous, three-celled, with a stout, straight, glabrous style and minute stigma. *Ovules* two, collateral, ascending. *Seeds* solitary in each cell; *testa* glabrous?

Nat. Ord. XVII. ELÆOCARPEÆ.

The majority of *Elæocarpeæ* are tropical Indian, and belong to the genus *Elæocarpus*, of which one species inhabits New South Wales. Several species are natives of New Zealand, and others of the Pacific Islands. As an Order this is hardly sufficiently distinct from *Tiliaceæ*, of which there are about fifteen tropical Australian species.

Gen. I. ARISTOTELIA, *L'Hérit.*

Sepala 4–5, valvata v. subimbricata. *Petala* 4–5, plerumque apice lobata. *Stamina* plurima, disco carnoso inserta; *filamentis* brevibus; *antheris* elongatis, apice rimis v. poris dehiscentibus. *Ovarium* 2–4-loculare; loculis 2-ovulatis. *Bacca* carnosa, 2–4-locularis, septis membranaceis. *Semina* angulata; testa crustacea, extus carnosa v. membranacea, umbilico ventrali appendiculata; endopleura membranacea; *albumine* carnoso; *embryone* axili, recto; *cotyledonibus* dilatatis; *radicula* tereti, supera.—*Friesia*, DC.

In the New Zealand Flora I have explained my reasons for agreeing with Planchon in reducing *Friesia* to *Aristotelia*, a genus confined to Chili, New Zealand, and Tasmania. The Chilian species bears an acid eatable fruit, said to be advantageously used, made into a wine, in malignant fevers.—*Trees* or *shrubs*, with opposite, exstipulate leaves, and flowers in panicles or on single-flowered peduncles. *Sepals* four or five, valvate or slightly imbricating. *Petals* four or five, generally lobed at the apex. *Stamens* numerous, with short filaments, inserted in a fleshy disc; *anthers* linear, bursting with pores or short slits at the apex. *Ovary* two- to four-celled, with two superimposed ovules in each cell, and a straight, simple style. *Berry* fleshy, two- to four-celled; *septa* membranous. *Cells* one- or two-seeded. *Seeds* pendulous, angular. *Testa* crustaceous, usually with a fleshy outer coat. *Embryo* straight, in fleshy albumen, with terete radicle, and broad, flat cotyledons. (Named in honour of the Macedonian philosopher.)

1. **Aristotelia peduncularis** (Hook. fil.); glaberrima, foliis breve petiolatis oppositis ternisve elliptico- v. ovato- v. anguste lanceolatis acuminatis serratis, pedunculis gracilibus axillaribus unifloris, sepalis oblongo-lanceolatis, petalis trilobis, disco tomentoso, ovario tetragono 2–4-loculari, bacca obcordata 1–3-sperma.—Friesia peduncularis, *DC. Prodr.* i. 520; *Hook. Journ. Bot.* i. 250, ii. 414. Elæocarpus peduncularis, *Lab. Nov. Holl.* ii. 15. *t.* 155. (*Gunn*, 312.)

Hab. Southern and mountainous parts of the Island, in shaded places, common, ascending to 4000 feet. —(Fl. Nov. to Jan.) (*v. v.*)

A small, weak, straggling shrub, 2–4 feet high, everywhere glabrous. *Stems* slender, terete. *Leaves* opposite or ternate, very variable in size, 1–4 inches long, varying from elliptical-ovate or oblong to linear or lanceolate-oblong, coarsely toothed, shortly petioled. *Flowers* very variable in size, $\frac{1}{4}$–$\frac{1}{2}$ inch long, white, solitary or fascicled, on long, slender, curved, one-flowered pedicels, which are jointed beyond the middle. *Sepals* ovate-lanceolate, acute, nerved. *Petals* rather longer than the sepals, cuneate-oblong, three-lobed. *Disc* fleshy, subpyramidal, lobed, pubescent. *Stamens* ten to twelve, on the top of the disc; *filaments* curved, subulate. *Ovary* tetragonal, with four cells and two superimposed ovules attached close together in each cell. *Berry* obcordate, varying in size from a pea to a small cherry, and in colour from pink to black (stains purplish), four-celled, one- to three-seeded. *Seeds* elliptic-oblong, angled; *testa* coriaceous or crustaceous, with a fleshy surface; *albumen* fleshy; *embryo* straight, with a cylindrical radicle, and flat, oblong cotyledons.

Nat. Ord. XVIII. HYPERICINEÆ.

Hypericineæ are chiefly natives of Europe and America, and are, with comparatively few exceptions, inhabitants of temperate climates; some are however tropical: their nearest allies are the tropical *Clusiaceæ*. Very few species are Australian.

Gen. I. HYPERICUM, *L.*

Sepala 5, imbricata. *Petala* 5, contorta. *Stamina* plurima, in phalanges coalita v. libera, filamentis filiformibus. *Ovarium* 1–3-loculare; stigmatibus 3. *Capsula* membranacea v. coriacea, 1-locularis, 3-valvis, seminibus valvarum marginibus inflexis insertis.—Herbæ *v.* frutices; foliis *oppositis, exstipulatis*; floribus *solitariis subcymosisve.*

A large genus of plants, for the most part natives of the temperate regions of Europe and the mountains of Asia, and North and South America.—*Herbs* or *shrubs*, with often angled stems, the leaves, and sometimes petals and sepals, studded with glandular dots or glands. *Leaves* opposite, often sessile. *Sepals* five, imbricate. *Petals* five, crumpled in æstivation. *Stamens* numerous, with slender filaments, which are free, or united into bundles; *anthers* small. *Ovary* three-celled, with as many styles and small capitate stigmata. *Fruit* of three carpels, whose inflexed margins bear numerous minute seeds, but do not meet in the axis; *testa* often reticulated; *albumen* none. (Name, the ὑπηρικον of Dioscorides.)

1. **Hypericum gramineum** (Forst. Prodr. 53); caule simplici v. basi diviso et superne dichotomo erecto v. basi decumbente tetragono, foliis oblongis obtusis sessilibus subcordatis punctatis marginibus plerumque revolutis, sepalis oblongis obtusis v. ovatis acuminatis punctatis integerrimis, petalis calyce longioribus, filamentis fere liberis, capsula conica.—*Lab. Sert. Aust. Cal.* 53. *t.* 53; *Fl. N. Zeal.* i. 36. H. involutum, *Chois. in DC. Prodr.* i. 549; *Hook. Journ. Bot.* i. 251, ii. 415. H. pedicellare, *Endl. Plant. Hüg.* 12. Ascyrum involutum, *Lab. Fl. Nov. Holl.* ii. 32. *t.* 174. Brathys Billardieri *et* B. Forsteri, *Spach, Ann. Sc. Nat.* v. 367. (*Gunn*, 73.)

Hab. Abundant everywhere in good soil.—(Fl. Oct. Jan.) (*v. v.*)

Distrib. South-eastern and Western extratropical Australia, New Zealand, New Caledonia, and Cape of Good Hope?

An erect herb, a span or less high.—*Stems* four-angled, slender, sometimes decumbent at the base, simple or dichotomously divided. *Leaves* ¾–1 inch long, suberect, oblong, sessile, blunt, cordate at the base, dotted: margins more or less recurved or revolute. *Flowers* on long or short peduncles, ¼–½ inch broad. *Sepals* oblong, obtuse, or acute. *Petals* golden-yellow, variable in size, often curling inwards after flowering. *Stamens* numerous: filaments almost wholly free.

2. **Hypericum Japonicum** (Thunb. Fl. Jap. 295. t. 31); caule humifuso v. basi prostrato ascendente ramoso v. simplici tetragono, foliis sessilibus late oblongis obovatis obtusis punctatis planis marginibusve revolutis, sepalis oblongis obovatisve obtusis acutisve punctatis integerrimis, petalis calyce vix longioribus, filamentis liberis, capsula globosa v. oblonga acuta calycem vix superante.

Var. β. *humifusum*; caulibus humifusis basi ramosissimis, ramis simplicibus v. divisis.—*Fl. N. Zeal.* i. 37. Hypericum pusillum, *Chois. in DC. Prodr.* i. 549. Ascyrum humifusum, *Lab. Fl. Nov. Holl.* ii. 33. *t.* 175. (*Gunn*, 656.)

Hab. Both varieties abundant in hilly, humid situations throughout the Colony, growing amongst grass, etc.—(Fl. all summer.) (*v. v.*)

Distrib. New Zealand, Japan, India, Madagascar, South Chili?, California?

A much smaller, prostrate, more diffusely-branched, slenderer species than *H. gramineum*, with smaller leaves and flowers. Many states of it in New Zealand are with difficulty to be distinguished from *H. gramineum*. The sepals and leaves are however always broader and flatter, and the capsules more rounded.

Gen. II. EUCRYPHIA, *Cav.*

Sepala 4, scariosa, subcalyptratim coadunata, basi circumscisse decidua. *Petala* 4, convolutiva, decidua. *Stamina* plurima, disco carnoso inserta, libera; *antheræ* versatiles. *Ovarium* sessile, 5–12-loculare; *ovulis* 6, uniserialibus, pendulis; *stylis* 5–12, filiformibus; *stigmatibus* simplicibus. *Capsula* oblonga, costata, septicide 5–12-valvis; *valvis* cymbiformibus, ex axi centrali solutis. *Semina* pauca, inversa, compressa, alata. *Embryo* in axi albuminis parci rectus; *cotyledonibus* foliaceis, ellipticis; *radicula* brevissima, supera.—Arbores *v.* frutices; ramulis foliisque *oppositis;* pedunculis *axillaribus, solitariis,* 1-*floris, basi bracteatis.*

A beautiful genus, of which only three species have hitherto been detected, one in Chili and two in Tasmania. The Chilian species differs from the others in its twelve-celled capsule, very oblique petals, and crenate leaves. The Tasmanian species form shrubs or trees.—*Branches* opposite, terete; buds and young leaves covered with gum. *Leaves* opposite, exstipulate, glaucous below. *Flowers* axillary, solitary, pedicelled; *pedicels* with bracts at the base. *Calyx* small, of four scarious sepals, that cohere into a calyptra, which dehisces irregularly near the base of the flower. *Petals* four, membranous. *Stamens* numerous, inserted in many series on a pubescent disc; *anthers* short, versatile. *Ovary* five-celled in the Tasmanian species, with as many filiform styles and capitate stigmas. *Cells* with several pendulous ovules. *Capsule* five-valved; *valves* concave, with the outer coat separating from the inner. *Seeds* few, winged. (Name from *ευ, well,* and *κρυφος, closed;* in allusion to the calyptriform calyx.)

1. **Eucryphia Billiardieri** (Spach, Suites à Buffon, v. 345); foliis breve petiolatis lineari-oblongis obtusis.—Carpodontos lucida, *Lab. Voy.* ii. 16. *t.* 18, *Fl. N. Holl.* ii. 122; *DC. Prodr.* i. 556. (*Gunn,* 272.)

Hab. Mountainous districts, especially in the interior and towards the west and south coasts, *Labillardière,* etc.—(Fl. Feb.)

One of the most beautiful trees in Tasmania, growing 70–100 feet high, according to Gunn, though more generally 20–40, with a trunk 6–7 feet in circumference, and very straight.—*Leaves* 1½–2½ inches long, linear-oblong, rather broader at the base, blunt at both ends, shortly petioled. *Peduncles* longer than the petioles. *Flowers* very numerous, white, 1½–2 inches across. *Ovary* pubescent. *Capsules* linear-clavate, ¾ inch long.

2. **Eucryphia Milliganii** (Hook. fil.); foliis (parvis) late lineari-oblongis retusis emarginatisve. (*Gunn,* 1034.) (Tab. VIII.)

Hab. Macquarrie Harbour and Mount Sorrell, *Dr. Milligan;* Franklin River, *Gunn.*—(Fl. March.)

A much smaller, more alpine species than *E. lucida*, but otherwise very similar.—A bush or small tree, 15–20 feet high, densely branched. *Leaves* broader and shorter than in *E. lucida*, ½–1 inch long, retuse or emarginate at the apex. *Flowers* ½–¾ inch diameter. *Capsules* ⅓ inch long. *Pollen* of very minute hyaline elliptic grains.—Plate VIII. *A*, specimen from Macquarrie Harbour; *B*, from Mount Sorrel; *C*, fruiting specimen:—*all natural size;* fig. 1, petal; 2, stamen; 3, pollen; 4, ovary; 5, transverse section of ovary; 6, valves of fruit; 7, immature seed:—*all magnified.*

Nat. Ord. XIX. SAPINDACEÆ.

Sapindaceæ are very well represented in Australia, where about eighty species have been discovered, chiefly belonging to *Dodonæa*, which occurs all over the continent, but is most common in the extratropical parts. The other genera, of which the principal one is *Cupania*, are chiefly tropical.

Gen. I. DODONÆA, *L.*

Flores polygami. *Sepala* 3–5. *Corolla* 0. *Stamina* 5 v. plura, receptaculo inserta; *filamentis* brevissimis. *Ovarium* sessile, 2–5-gonum, 2–5-loculare; *ovulis* quovis loculo 2, superimpositis. *Capsula* membranacea, 2–5-valvis; *valvis* dorso alatis, a columna centrali persistente alata solutis. *Semina* loculis 2 v. abortu solitaria; *testa* crustacea.—Frutices *v.* arbores *sæpe resinosæ;* foliis *alternis, exstipulatis, interdum pinnatis;* floribus *racemosis paniculatisve.*

This is a very abundant genus in Australia, where fully fifty species have been discovered, which is more than have been found in any other part of the globe. All are shrubs or small trees, with alternate leaves, pinnate in some Australian species, always very variable in form and often full of resinous secretion.—*Flowers* generally panicled, unisexual or polygamous. *Sepals* three to five. *Petals* none. *Stamens* five or more; *anthers* generally linear-oblong, often sessile. *Ovary* sessile, two- to five-celled and angled; *ovules* two, superimposed in each cell. *Capsule* membranous, two- to five-valved. *Valves* winged at the back, separating from a central winged column. *Seeds* with a crustaceous testa. (Named in honour of *Rambert Dodoens*, a German botanist of the sixteenth century.)

1. **Dodonæa viscosa** (Forst. Prodr. 27); foliis obovato-oblongis lanceolatis v. lanceolato-spathulatis basi cuneatis viscosis, capsula 2–3-alata.—*DC. Prodr.* i. 614; *Fl. N. Zeal.* i. 38.

Var. *β. aspleniifolia;* foliis lineari-obovatis acutis v. apice inæqualiter trilobis.—D. aspleniifolia, *Rudge in Linn. Soc. Trans.* ii. 297. *t.* 20. D. aspleniifolia, var. *β*, *Hook. Journ. Bot.* i. 251, ii. 415. D. spathulata, *Smith in Rees' Cycl.* xii. D. conferta, *Don, Syst. Gard.* (*Gunn*, 377.)

Hab. Var. *β*. Common in poor soil, especially near the coast, *Labillardière.*—(Fl. Sept.) (*v. v.*)

Distrib. All warm and hot latitudes, New Zealand, Pacific Islands, Malay Islands, India, Tropical Africa, and America.

I have no hesitation in reducing the Tasmanian species to a state of the ubiquitous *D. viscosa*, which has much larger leaves in moister climates than in Tasmania and Australia south of the Tropic. The leaves are seldom toothed in my specimens, and I find toothed leaves in Texan ones, which, together with there being no difference in the flower or fruit that is not common to all localities, leaves no doubt of its identity. Indeed, considering how wide the range of *D. viscosa* is, and that it is common throughout the Northern and Middle Islands of New Zealand, its absence in Tasmania would be anomalous.—A small tree, according to Gunn 6–10 feet high, and extremely variable in habit and foliage. Wood described in New Zealand as very hard, variegated black and white. *Branchlets* compressed or angular. *Leaves* 1–3 inches long, very variable in breadth, linear-obovate or spathulate or obovate-lanceolate, narrowed into a short petiole, blunt or acute, entire or obliquely two- or three-toothed at the extremity. *Flowers* abundant, as are the capsules, which are densely crowded, on short racemes, with slender pedicels. *Capsules* two- to four-winged; wings $\frac{1}{4}$–$\frac{1}{2}$ inch broad, variable in length and breadth.—The whole plant, especially the young leaves, abounds in a resinous secretion.

2. **Dodonæa salsolifolia** (A. Cunn. MSS. Hook. Journ. Bot. i. 251); foliis confertis anguste lineari-elongatis integerrimis subacutis superne canaliculatis subcarnosis, floribus masculis glomeratis, fœmineis subsolitariis. (*Gunn*, 9.)

Hab. Not uncommon by banks of rivers, etc.; Launceston, New Norfolk, etc., *Fraser, Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. Port Jackson (*fid. A. Cunn.*).

A small shrub, much branched and densely leafy.—*Leaves* crowded, $\frac{3}{4}$–1 inch long, 1 line broad, narrow-linear, fleshy, quite entire. *Male flowers* small, three or four together, on short axillary peduncles. *Sepals* lanceolate. *Stamens* five or six, almost sessile. *Female flowers* solitary, or few together. *Capsules* similar to those of *D. viscosa*, but rather smaller.

Nat. Ord. XX. GERANIACEÆ, *Juss.*

Geraniaceæ is a very large and widely diffused Natural Order, being however far more abundant in South Africa than in any other part of the globe. There are few Australian species but those described below as Tasmanian also.

Gen. I. GERANIUM, *Juss.*

Sepala et *petala* 5, æqualia. *Stamina* 10, fertilia alterna majora, basi glandulis instructa. *Carpellorum* aristæ intus glabræ, elastice e basi ad axeos apicem circinatim revolutæ.—Herbæ *v.* suffruticuli; foliis *stipulatis.*

A very widely diffused genus, common in all temperate and warm quarters of the globe, and particularly abundant in South Africa. There are very few Australian species, and none that appear to differ remarkably from the Tasmanian ones. After a very long and careful study of the Tasmanian forms of this genus, I find myself quite unable to draw up any good specific characters for them; the amount and kind of hairiness of stem, peduncles, petioles, and leaves, the number, depth, and breadth of the lobes of the leaf, the number of flowers on each peduncle (one to three), the size of the flower, the characters of the sepals, petals, and carpels, and, finally, the habit, all seem to present interminable variations. Under these circumstances I retain the species as hitherto proposed, and caution the student that they are provisional only. I am much guided in my division by Gunn's numbers and notes.—*Flowers* regular. *Sepals* and *petals* five. *Stamens* ten, five fertile; filaments of the alternate ones longer, with glands at the base. *Carpels* five, their awns rolling back elastically from a central axis, becoming spirally twisted, glabrous on the inner face. (Name from γερανος, *a crane;* in allusion to the beak of the carpels.)

1. **Geranium dissectum** (Linn. Sp. Pl. 956); caule decumbente v. suberecto patentim v. retrorsum piloso rarius glabrato, foliis rotundatis 5–7-partitis lobatisve laciniis linearibus dissectis obtusis apiculatis acutisve, pedunculis bifloris, sepalis pilosis aristatis, petalis calyce brevioribus v. rarius longioribus emarginatis, capsulis lævibus pilosis, seminibus reticulatim punctatis.—*Fl. N. Zeal.* i. 39.

Var. β. *pilosum;* pilis patentibus.—*Fl. N. Zeal.* i. 39. G. pilosum, *Forst. Prodr.* 531; *DC. Prodr.* i. 642; *Sweet, Geran.* ii. 119; *Nees in Plant. Preiss.* ii. 162; *Hook. Journ. Bot.* ii. 415. (*Gunn,* 259?)

Var. γ. *retrorsum;* robustior, pilis retrorsis.—*Fl. N. Zeal.* i. 39. G. retrorsum, *L'Hér. MSS. in DC. Prodr.* i. 644. (*Gunn,* 789.)

Var. δ. *glabratum;* foliis 3–5-lobis, lobis late cuneatis 3–5-fidis.—*Fl. N. Zeal. l. c.*

Hab. Common throughout the Island in many situations. Var. γ. Circular Head, etc., *Gunn.*—(Fl. all summer.)

Distrib. Var. β, γ, and δ. New Zealand, New South Wales, and South-eastern and Western Australia.

In the New Zealand Flora I have detailed the differences between the Australian and the European and North American forms of this species; it is a very common weed, extremely variable in stature and habit, but generally easily recognized by the lobed leaves, spreading or recurved hairs, and deep red small petals. Var. *retrorsum* is coarser and more robust than vars. *pilosum* or *glabratum*, and is covered with white retrorse hairs.—*Stems* 2–3 feet high, much branched, suberect. *Leaves* 1–2 inches across, with sharp lobes, hispid-pilose. *Peduncles* shorter than the petioles, two-flowered; peduncles and pedicels hispid, with spreading hairs. *Sepals* ovate-acuminate, hispid, as are the young carpels. *Petals* red-purple, scarcely longer than the sepals. *Capsules* and *seeds* not seen; the latter, in New Zealand specimens, are reticulated with impressed dots.—The var. *pilosum* is very similar, but has fewer and more patent hairs; it is undistinguishable from some states of *G. potentilloides:* the lobes of its leaves are blunt or truncate, rarely acute.

2. **Geranium potentilloides** (L'Hérit. in DC. Prodr. i. 639); caule decumbente ramoso superne petiolis pedunculisque appresse rarius patentim pilosis canisque, foliis 5–7-lobis partitisve segmentis cuneatis trifidis acutis, pedunculis 1-floris bibracteolatis, petalis pallidis, capsulis lævibus parce pilosis obscure carinatis, seminibus minute punctulatis.—*Hook. Journ. Bot.* i. 252; *Fl. N. Zeal.* i. 40. (*Gunn*, 259, 1035.)

Var. β. *parviflora;* floribus minoribus.—G. parviflorum, *Willd. En.* 716; *DC. Prodr.* i. 642; *Hook. Journ. Bot.* i. 252. (*Gunn*, 63, 453.)

Hab. Abundant throughout the Colony.—(Fl. all summer.) (*v. v.*)

Distrib. South-eastern Australia, New South Wales, New Zealand, and Auckland Island.

A smaller, more straggling, slender-stemmed plant than *G. dissectum*, with smaller leaves, more glabrous sepals, and often much larger flowers; the latter however in var. β are quite as small as in *G. dissectum.*—*Stems* a foot and more long, much diffusely branched, weak and prostrate, usually pilose or silky, with appressed, rarely patent hairs. *Leaves* ½–1 inch broad, five- to seven-lobed to the base; the lobes obcuneate or narrow-oblong, blunt, truncate, or acute. *Peduncles* generally two- sometimes one-flowered. *Flowers* varying from ¼ to ¾ inch across. *Sepals* glabrous or pilose, or pubescent with appressed hairs. *Petals* white, pink, or purplish-red, longer than the sepals. *Seeds* punctate.

3. **Geranium brevicaule** (Hook. Journ. Bot. ii. 252); radice crassa, caulibus abbreviatis, pedunculis petiolisque pilosis pilis longis retrorsum appressis patulisve rarius glabratis, foliis 5–7-partitis lobatisve, lobis cuneatis trifidis v. incisis, lobulis acutis v. obtusis, pedunculis validis 1-floris infra florem dense sericeo-barbatis basin versus bibracteolatis, calycibus villosis, petalis pallidis, capsulis pilosis lævibus, seminibus lævibus v. minutissime punctulatis.—*Fl. N. Zeal.* i. 40. (*Gunn*, 250.)

Hab. Alpine districts, elev. 3000–4000 feet; common, *Gunn.*—(Fl. Jan.)

Distrib. Mountains of New Zealand.

This appears to me to be probably an alpine state of *G. potentilloides* or *dissectum*, which, owing to the climate of the regions it inhabits, forms very short stems, or none at all, and sends its leaves and peduncles up from very near the root. It is stunted in all its parts, and more villous in many, especially on the peduncles.—*Root* very stout and woody, a character no doubt induced by climate.

Gen. II. PELARGONIUM, *L'Hérit.*

Sepala 5, supremo in calcar cum pedunculo adnatum producto. *Petala* 4–5, inæqualia v. subæqualia. *Stamina* 4–7 fertilia, reliqua sterilia. *Carpellorum* rostra intus barbata.

A very large and almost exclusively South African genus of excessively variable plants, of which there are very few Australian species. It differs from *Geranium* in the irregular flowers, in one sepal having a spur which is adnate to the pedicel of the flower, in the irregular, scale-like, sterile filaments, and in the beaks of the carpels being bearded along the inner face. (Name from πελαργος, *a stork;* in allusion to the beaked carpels.)

1. **Pelargonium australe** (Willd. Sp. Pl. iii. 675); foliis late ovato-orbiculatis cordatis sublobatis crenato-dentatis, pedunculis multifloris, fructiferis erectis, petalis calyce longioribus.—*DC. Prodr.* i. 654. *An* P. odoratissimum, *Linn. Sp. Pl.?*

Var. *a. major;* suberecta, patentim pilosa tomentosa v. villosa, sepalis villosis.—P. australe, *Jacq. Eclog.* i. 149. *t.* 100. (*Gunn*, 61, 787.)

Var. β. *glabrata;* minor, glabrata, caulibus gracilibus, sepalis pubescentibus rarius villosis. (*Gunn*, 658.)

Hab. Abundant in many parts of the Colony, especially near the sea.—(Flowering throughout the summer.) (*v. v.*)

Distrib. Extratropical Australia, Cape of Good Hope?

I have repeatedly studied the forms of this variable plant, of which Gunn has sent several, and of which we have as many from South Australia. Gunn at one time (according to his notes) believed that there were several species; but as his specimens increased, the characters broke down, and I can now find no distinction between any of them. Much depends on the age of the specimens, seedlings (which resemble annuals) being much smaller in all their parts, less glabrous, and with narrower, deeper-coloured petals; and there are doubtless other variations that may be referred to local causes, but which have no constancy, for the species grows in sea-sand, pasture-ground, and on rocks. The variation in the length of the spur is one of its most remarkable features, this being sometimes produced downwards on the pedicel for half an inch, and at others forming a mere protuberance beneath the calyx. The stems are suberect or procumbent, glabrous, or covered with soft spreading hairs, and the peduncles are long or short, erect, patent, or deflexed; these differences, together with those of size of foliage and petals, afford such prominent characters that it is impossible, without examining a large suite of specimens, to believe them inconstant and specifically worthless. Of this however I am convinced, no less from Gunn's specimens than from the Australian ones, to which must be added the argument derived from the extreme tendency to sport amongst the cultivated species of the genus. In its largest state it is a very handsome plant; in its smallest an insignificant weed. Whether or not all should not be referred to a Cape of Good Hope species (*P. odoratissimum*, Drege, 1298 *b*, Zeyher, 426, 193; *P. brevirostre*, E. Meyer) is more doubtful; and I have not sufficient specimens of that to clear up the point. Seedling plants have the leaves more lobed than older ones.

2. **Pelargonium Acugnaticum** (Pet. Th. Fl. Trist. Acunh. 44. t. 13); caule suberecto piloso, foliis ovato-orbiculatis cordatis, pedunculis multifloris, petalis calyce æquilongis v. brevioribus.—*DC. Prodr.* i. 660. P. clandestinum, *L'Hérit. ined.; Fl. N. Zeal.* i. 41. P. erodioides, *Hook. Journ. Bot.* i. 252, ii. 416. (*Gunn*, 1049.)

Hab. Flinders' Island, Bass' Straits, and Circular Head, *Gunn*.—(Fl. all summer.)

Distrib. New Zealand, Tristan d'Acunha, Cape of Good Hope?

The only Tasmanian specimens I possess are not more than 6 inches high, and are more slender than the majority of the New Zealand ones, which grow 2–3 feet high. It seems quite the same with a Cape of Good Hope species (Drege, 7466), of which however I have seen but one specimen, and therefore cannot identify it satisfactorily. The only important character between this and the *P. australe* resides in the very small petals, and these organs vary so much in *P. australe* that I doubt its validity.

Erodium cicutarium, L., a European introduced weed, is now commonly spread in Tasmania.

Nat. Ord. XXI. OXALIDEÆ.

Oxalis is the only Australian genus of the Order, and there are very few species of it indigenous to that continent, probably only one, and that common to all temperate and warm latitudes. The majority of the genus inhabit the Cape of Good Hope and South America, and there are also a few tropical shrubby and arboreous genera. Most of the species abound in *oxalic* acid, whence the name Wood Sorrel for the common English species, which is closely allied to *O. Magellanica*.

Gen. I. OXALIS, *L.*

Sepala et *petala* 5. *Stamina* 10; filamentis basi monadelphis, 5 alternis brevioribus. *Styli* 5, stigmatibus capitatis. *Capsula* 5-gona, 5-locularis, 5-valvis.—Herbæ; foliis *in speciebus Australasicis* 3-*foliolatis*.

This genus may be known by the obcordate, trifoliolate leaves, and flowers not being papilionaceous, for the Leguminous genera *Psoralea* and *Swainsonia* are the only others with similar foliage in Tasmania.—*Sepals* and *petals* five. *Stamens* ten; filaments united at the base, five shorter than the others. *Ovary* five-celled, with many ovules in each cell, and five styles with capitate stigmata. *Capsule* five-angled, five-celled, five-valved. *Seeds* as in the ordinal character. (Name from ὀξυς, *sharp* or *acid*.)

1. **Oxalis Magellanica** (Forst. Comm. Gœtt. ix. 33); acaulis, pilosa v. glabrata, rhizomate repente squamoso, stipulis magnis bullatis scariosis, foliolis late obcordatis subtus glaucis, scapo 1-floro petiolo æquilongo v. longiore 2-bracteolato, sepalis oblongis obtusis, petalis albis obovatis apice retusis v. oblique bilobis glaberrimis v. ciliatis, capsula globosa membranacea.—*DC. Prodr.* i. 700; *Fl. Ant.* ii. 253; *Fl. N. Zeal.* i. 42. *t.* 13. O. lactea, *Hook. Journ. Bot.* ii. 416. O. cataractæ, *A. Cunn. Prodr. Fl. N. Zeal. in Ann. Nat. Hist.* iii. 315; *Hook. Ic. Pl. t.* 418. (*Gunn*, 370.)

Hab. Mountain woods and by streams in various parts of the Colony, elev. 1500–3000 feet.—(Fl. Nov. Feb.)

Distrib. New Zealand, South Chili, and Fuegia.

A very delicate, white-flowered plant, glabrous or pilose.—*Rhizomes* red-brown, covered with large membranous concave scales. *Stipules* large, concave. *Leaflets* pale green, broadly obcordate, glaucous below. *Petioles* and *peduncles* generally pilose. *Scapes* variable in length, one-flowered, with two bracteolæ above the middle. *Petals* very membranous, $\frac{1}{4}$—$\frac{1}{3}$ inch long, oblong-obovate or obcordate, often oblique, and ciliated. *Capsule* membranous, globose.

2. **Oxalis corniculata** (L. Sp. Pl. 624); pilosa v. glabrata, caule erecto v. decumbente v. repente folioso, foliolis profunde obcordatis, pedunculis 1–6-floris petiolo æquilongis longioribusve, petalis flavis emarginatis, capsulis 5-gonis oblongis linearibusve. (*Gunn*, 94, 370.)

Var. β. *stricta* (Fl. N. Zeal. i. 42); erecta v. suberecta, stipulis 0.—O. stricta, *Auct.*

Var. γ. *microphylla* (Fl. N. Zeal. i. 42); caule procumbente radicante, foliolis minimis, capsulis oblongis.—O. microphylla, *Poiret, Suppl.* iv. 248; *DC. Prodr.* i. 692; *Hook. Journ. Bot.* i. 253. O. reptans, *Forst. Prodr.* 519.

Hab. Common in pastures, waste places, etc., throughout the Colony.—(Fl. all the year.) (*v. v.*)

Distrib. Throughout Australia, New Zealand, and almost all tropical and temperate countries.

Roots sometimes very woody and knotted. *Stems* 1–18 inches high, long or short, erect, decumbent or creeping, simple or divided, glabrous or pilose. *Leaflets* deeply obcordate. *Peduncles* one- to six-flowered. *Flowers* yellow. *Capsule* linear or oblong-linear.—This is one of the most widely diffused and variable plants in the world.

Nat. Ord. XXII. ZYGOPHYLLEÆ.

This Natural Order is chiefly tropical, and represented by few southern species. *Roepera* is the only New Holland genus peculiar to that continent, and contains three or four chiefly littoral species. It is hardly generically distinct from *Zygophyllum*, with which it has been reunited by Sonder. The ubiquitous tropical *Tribulus cistoides* is found on the north coast, and as far south as Swan River, and there are perhaps two other species of that genus within the tropics.

Gen. I. RŒPERA, *Adr. Juss.*

Sepala 4–5, persistentia. *Petala* 4–5, unguiculata. *Stamina* 8–10, petalis breviora; filamentis subulatis

v. basi late membranaceo-alatis, superne subulatis; *antheris* oblongis. *Ovarium* toro quadrato stipatum, 4-angulare; *ovulis* loculis 2–6, superpositis, pendulis, micropylo supero. *Stylus* ovario continuus, tortus; *stigmate* minute 4-lobo. *Capsula* 4-locularis, subloculicide 4-valvis, 4-angulata v. 4-alata. *Semina* loculis 1–2; *testa* scabra. *Embryo* albumine tenui orthotropus; *cotyledonibus* plano-convexis; *radicula* brevi, supera.—Herbæ *plerumque littorales, facie* Zygophylli.

I have modified the generic character so as to include the Tasmanian (and several Australian) species, which have decidedly dehiscent capsules (as in *Zygophyllum*), and of which one has filaments with broad lacerated wings, and the other subulate filaments, and neither of which have scales at the base of the ovary. *Sepals* persistent, and *petals* four or five, the latter clawed. *Stamens* eight to ten, with subulate or winged filaments. *Ovary* on a raised torus, obconical, with a subulate twisted style, four-celled; *cells* with two to six pendulous ovules in each. *Capsule* membranous, obcuneate, four-lobed or four-winged, four-celled; *cells* one- or two-seeded, dehiscing down each cell; walls of an outer green herbaceous layer, and an inner thin white parchment. *Seeds* pendulous, one or two ripening in each cell.—Herbaceous, jointed plants, with opposite bifoliolate stipulate leaves, and axillary solitary yellow flowers. (Named in honour of *Professor Röper*, of Bâle.)

1. **Rœpera Billardieri** (A. Juss. Mem. Mus. xii. 454); prostrata, foliolis lineari-oblongis, sepalis petalisque plerumque 4, filamentis subulatis.—Zygophyllum Billardieri, *Hook. Comp. Bot. Mag.* i. 276. *An DC. Prodr.* i. 705? (*Gunn*, 552.)

Hab. Flinders' Island, Bass' Straits, *Backhouse*.—(Fl. summer?)

Distrib. King George's Sound and Swan River.

A prostrate, rather fleshy, jointed plant.—*Stems* 6 inches to a foot long. *Stipules* broadly ovate. *Petioles* $\frac{1}{2}$–$\frac{3}{4}$ inch long, not winged. *Stipellæ* ovate, acuminate. *Leaflets* $\frac{1}{2}$–$\frac{3}{4}$ inch long, $\frac{1}{4}$ inch broad. *Flowers* axillary, solitary, pedicelled, $\frac{3}{4}$ inch across. *Sepals* four, ovate, concave, acute, margins rolled inwards, finally persistent and reflexed. *Petals* four, obovate, clawed, yellow. *Stamens* eight; *anthers* subulate. *Ovary* with four to six ovules in each cell. *Fruit* obconical or truncate at the apex, with a slight projection in the middle towards the persistent subulate style. *Seeds* one or two in each cell. *Testa* densely covered with spiral filaments. *Albumen* fleshy, firm. *Embryo* large. *Cotyledons* oblong; *radicle* very short.

2. **Rœpera latifolia** (Hook. fil.); prostrata, foliolis obovatis oblongisve, sepalis petalisque plerumque 5, filamentis utrinque late alatis apice subulatis, ala lacera superne dilatata.—Zygophyllum apiculatum, *Müller in Hb. Hook.* (*Gunn*, 552.)

Hab. Goose Island, Bass' Straits, *Gunn*.—(Fl. Nov.)

Distrib. Interior of New South Wales, South-eastern and Western Australia.

A larger species than the preceding, with broader leaflets and larger flowers, but best distinguished by the filaments having broad lacerated wings, dilated upwards, terminating abruptly above the middle, their apex subulate.

Nat. Ord. XXIII. RUTACEÆ.

There are more species of this Natural Order in Australia than in any country of equal area, except perhaps the Cape of Good Hope, which in this respect presents a remarkable analogy with Australia. Most of the species, of which there are upwards of one hundred and sixty known, belong to the tribe *Boronieæ*, which is almost confined to this continent. New Zealand contrasts remarkably with Australia in the rarity of *Rutaceæ*, which is less anomalous, because the species prefer a dry climate and soil. In company with the *Epacrideæ* the Boronias cover great heathy tracts of land; they diffuse a strong aromatic odour.

Gen. I. CORREA, *Smith.*

Calyx truncatus v. 4-dentatus, persistens. *Petala* 4, libera v. in tubum coalita. *Stamina* 8, disco hypogyno inserta. *Ovarium* 8-lobum. *Stylus* persistens; stigmate simplici. *Capsula* 2–4-cocca; coccis compressis 2-valvibus. *Semina* subreniformia; testa crustacea.—Frutices *v.* arbusculæ *plerumque stellatim tomentosæ;* foliis *oppositis;* floribus *axillaribus.*

This is an extratropical Australian genus, almost confined to the south coast, and chiefly to Bass' Straits There are about twelve known species, the westernmost of which inhabits King George's Sound. One is found near the tropic, on the east side of the continent. The species are extremely variable and difficult to determine some of the Tasmanian ones will probably be reduced. All are shrubs or small trees, with opposite leaves, generally densely woolly beneath.—*Flowers* solitary or few together, axillary or terminal. *Calyx* hemispherical, truncate, obscurely four-toothed, rarely with long segments. *Corolla* cylindrical, much longer than the calyx; *segments* generally united for nearly their whole length, with valvate, erect or recurved short apices, tomentose or pubescent externally. *Stamens* eight, included or partially exserted. *Capsule* of four cocci, of which one or more are often imperfect; *cocci* two-valved, with a cartilaginous endocarp, one- or two-seeded. *Seeds* with a crustaceous testa, and a straight slender embryo immersed in fleshy albumen. (Named in honour of *Correa de Serra*, an eminent Portuguese botanist.)

1. **Correa rufa** (Gærtn. Fruct. iii. 155. t. 210); foliis parvis ovatis ellipticis oblongis rotundatisve obtusis subtus albo- v. rufo-tomentosis, floribus parvis breve pedicellatis erectis, petalis brevibus liberis.—*DC. Prodr.* i. 719. C. alba, *Andr. Bot. Rep. t.* 18; *Vent. Malm. t.* 13; *DC. Prodr.* i. 719; *Hook. Journ. Bot.* i. 253. C. cotinifolia, *Sal. Par. Lond. t.* 100. Mazeutoxeron rufum, *Lab. Voy.* ii. 11. *t.* 17. (*Gunn,* 428.)

Hab. Abundant, especially near the coast, *Labillardière.*—(Fl. March, April.) (*v. v.*)

Distrib. South-eastern coasts of Australia, and islands of Bass' Straits.

A shrub, 2–4 feet high.—*Leaves* small, densely covered below with white or red tomentum, rounded or elliptical or oblong or oblong-ovate, coriaceous, $\frac{3}{4}$–$1\frac{1}{2}$ inch long. *Flowers* small, sessile or on short pedicels, erect. *Calyx* obscurely four-toothed. *Sepals* recurved, $\frac{1}{3}$ inch long.—Easily recognized by the small erect flowers, with free petals.

2. **Correa Backhousiana** (Hook. Journ. Bot. 1253); foliis oblongis v. ovato- v. elliptico-oblongis basi obtusis v. obscure cordatis subtus albo- v. fusco-tomentosis, floribus breve pedicellatis nutantibus v. pendulis, corollæ tubo elongato, petalis coalitis.—*Hook. Comp. Bot. Mag.* 276, *Journ. Bot.* ii. 417, *Ic. Plant. t.* 11. (*Gunn,* 456.)

Hab. North coast, Cape Grim, *Backhouse.* Circular Head, Woolnorth, and Robbin's Island, Bass' Straits, *Gunn.*—(Fl. August.)

Distrib. South-eastern coast of Australia.

A shrub, 2–6 feet high, varying exceedingly in habit (*fid.* Gunn) according to situation, as also in the colour of the tomentum and form of the foliage. The flowers, which are normally pendulous, in very densely leafy bushes become sometimes erect, or point every way. *Leaves* larger than in *C. rufa*, more generally ovate, with an obscurely cordate base, sometimes emarginate at the apex. *Flowers* greenish-white, $1\frac{1}{2}$ inch long. *Petals* all joined together, with straight apices.

3. **Correa Lawrenciana** (Hook. Journ. Bot. i. 254); foliis lineari- v. elliptico-oblongis lanceolatisve obtusis subtus glabris tomentosis pannosisve, floribus pendulis, corolla elongata, petalis coalitis, staminibus exsertis.

Var. *α. glabra;* foliis subtus glabris parce punctato-pannosisve 1 unc. longis anguste elliptico-oblongis.—C. Lawrenciana, *Hook. l. c.* C. Schlechtendahlii, *Behr. in Linnæa,* 1847, 630 (*fid. Müller*). C. leucoclada, *Lindley in Mitchell's Journ. et Ann. Sc. Nat. ser.* 2. xv. 58. C. glabra, *Lindl. l. c.* (*Gunn,* 153.)

Var. *β. ferruginea;* foliis subtus albo- v. rufo-tomentosis pannosisve 1–3 unc. longis.—C. ferruginea, *Hook. Comp. Bot. Mag.* 276, *Ic. Pl. t.* 3. (*Gunn,* 457.)

Hab. Abundant throughout the Colony; var. *α* in the northern parts, *Lawrence, etc.;* var. *β* chiefly in the southern districts, *Gunn, Backhouse, etc.*—(Fl. June to August.) (*v. v.*)

Distrib. South-eastern Australia.

An erect, generally slender shrub or small tree, 4–12 feet high, very variable in habit (*Gunn*). *Young branches* covered with ferruginous down. *Leaves* 1–1½ inch long, generally longer and narrower than in either of the preceding species, linear-oblong or elliptical or oblong-lanceolate, blunt, beneath glabrous or dotted with woolly hairs or densely covered with white or rusty tomentum, narrowed at the base into the petioles, which are rather slender and ¼ inch long. *Pedicels* slender, curved, and as well as the short cup-shaped *calyx* densely tomentose with ferruginous down. *Calyx* teeth short, remote. *Corolla* pendulous, 1–1½ inch long, green or white, with straight lobes. *Stamens* much exserted.

Gunn rightly remarks (in his notes) that the *C. ferruginea* is only the southern state of *C. Lawrenciana*, with often larger leaves and rufous tomentum on their under surface. It is probably a common South Australian plant, and I have examined what resembles a dry country glabrous form of it, from King George's Sound; but it is impossible to determine these plants from single specimens.

4. **Correa speciosa** (Andr. Bot. Rep. t. 653); ramulis pannoso-tomentosis, foliis patentibus deflexisve ovato- v. oblongo-cordatis oblongisve obtusis bullatis marginibus recurvis subtus pannoso-tomentosis (rarius glabris), floribus pendulis, corolla cylindracea, petalis coalitis, staminibus subexsertis.

Var. *α*; foliis ovatis obtusis subtus ferrugineo-tomentosis, floribus supra medium rubris.—C. speciosa, *Ker. Bot. Reg. t.* 26; *Sims, Bot. Mag. t.* 1746; *Lois. Herb. Am.* 309; *DC. Prodr.* i. 719; *Hook. Journ. Bot.* ii. 417. (*Gunn,* 663.)

Var. *β*; foliis ovatis ovato-cordatisve minus tomentosis v. subtus glabris.—*Journ. Bot. l. c.* (*Sieber,* 239.)

Var. *γ. virens;* foliis ovato- v. oblongo-cordatis subtus pannoso-tomentosis glabratisve, floribus viridibus.—C. virens, *Smith, Exot. Bot.* ii. 25. *t.* 72; *DC. Prodr.* i. 719; *Hook. Journ. Bot.* 253, *Comp. Bot. Mag.* 276. C. viridiflora, *Andr. Bot. Rep. t.* 436. C. reflexa, *Pers. Ench.* i. 419. Mazeutoxeron reflexum, *Lab. Voy.* ii. 66. *t.* 19. (*Gunn,* 152, 1036.)

Var. *δ. nummulariæfolia;* foliis confertis parvis rotundato-cordatis ramulisque pannoso-tomentosis, floribus minoribus. (*Gunn,* 1945.)

Hab. Var. *α*. Georgetown, etc.; most common in the northern parts. Var. *γ*. Abundant throughout the Colony. Var. *δ*. Flinders' Island, *Backhouse.*—(Fl. all the winter.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A small shrub, 2–5 feet high, of rigid growth, very variable in size and habit.—*Leaves* generally deflexed, shortly petioled, oblong or ovate-cordate, or more rarely rounded, or (most rarely) elliptical-oblong, with recurved margins and a bullate upper surface, rarely flat, wrinkled or smooth above, below glabrous, or generally more or less densely covered with white, greenish, or rufous tomentum, which is dense or floccose, and the same extends to the peduncles, petioles, and branchlets. *Flowers* always pendulous, green and bright red in the drier northern parts of the Colony, green in the southern, rarely yellow. *Calyx* hemispherical, truncate, obscurely four-toothed. *Corolla* 1–1½ inch long, cylindrical, the petals all united. *Stamens* exserted.—Gunn rightly remarks that *C. virens* is nothing but the southern form of *C. speciosa*, which is always more tomentose in the southern parts of the Colony.

The character of the flowers being erect, as given by De Candolle and others, is erroneous. The var. δ. *nummulariæfolia* is evidently a starved form from exposed places; it strongly resembles states of *C. Backhousiana*.

Gen. II. PHEBALIUM, *Vent.*

Calyx 4–5-fidus. *Petala* 4–5, imbricata (rarius valvata). *Stamina* 8, sub disco hypogyno inserta; *filamentis* glabris. *Ovaria* 4–5 (rarius 2), disco inserta, lepidota v. pilosa. *Stylus* 1, teres v. angulatus; *stigmate* simplici, capitato. *Capsula* 2–5-cocca. *Semen* 1, ovatum, testa crustacea, umbilico ventrali. *Embryo* axi albuminis carnosi, gracilis, teres, radicula supera.—Frutices *pubescentes, tomentosi v. lepidoti, glandulosi;* foliis *alternis, glanduloso-punctatis;* floribus *axillaribus, subcymosis v. paniculatis.*

An extensive Australian genus, containing upwards of thirty species, all extratropical, and mostly natives of the West Coast. One species is a native of New Zealand.—Glandular, pubescent, scaly or pilose, suffruticose or shrubby plants, with alternate glandular leaves, and flowers in axillary cymes or panicles. They are often best distinguished from *Eriostemon* by the more slender glabrous filaments. *Calyx* quadrifid or quinquefid. *Petals* four or five. *Stamens* eight, inserted on a hypogynous disc; filaments glabrous. *Ovaries* four or five, rarely fewer, lepidote or pilose. *Style* one, terete or angled. *Stigma* simple, capitate. *Capsule* of two to five cocci. *Seeds* solitary, ovate, with a crustaceous testa. *Embryo* in the axis of fleshy albumen. (Name, that of the Myrtle, and inapplicable.)

1. **Phebalium Billardieri** (Adr. Juss. Mém. Soc. Hist. Nat. Paris, ii. 134); frutex erectus, ramulis fusco-lepidotis, foliis lineari-lanceolatis oblongo-linearibusve acutis obtusis retusisve subtus albo-lepidotis, cymis axillaribus 3–5-floris v. ternatim multifloris.—*Hook. Comp. Bot. Mag.* i. 277. P. elæagnifolium, *Sieber, Pl. Exsicc. n.* 111. Eriostemon squamea, *Lab. Nov. Holl.* i. 111. *t.* 141. (*Gunn*, 454.)

Var. β. *retusum;* minor, foliis minoribus densioribus apice retusis.—P. retusum, *Hook. Comp. Bot. Mag.* i. 254, *Ic. Pl. t.* 57. (*Gunn*, 455.)

Hab. Abundant throughout the Colony in damp woods. Var. β. In drier places, *Labillardière, etc.* —(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales.

A small tree or shrub, 4–10 feet high, conspicuous for its strong smell, silvery under surface of the leaves, and numerous small white and pink flowers.—*Leaves* 1–3 inches long, lanceolate, ovate or linear-lanceolate or linear-oblong, sharp, blunt, retuse, or almost bifid at the point; under surface covered densely with appressed silvery or rufous scales. *Flowers* small, ¼ inch across, in lepidote cymes, which are reduced to three-flowered peduncles, or ternately branched and many-flowered. *Ovules* superimposed, ascending; micropyle upwards. *Fruit* small, of four or more glabrous, wrinkled, obovate-cuneate cocci, ⅛ inch long.

The *P. retusum* is certainly only a variety of *P. Billardieri* growing in more open places. The Australian specimens have generally smaller flowers, but not constantly so.

2. **Phebalium montanum** (Hook. Ic. Pl. t. 59); fruticulus depressus glaberrimus, ramulis cicatricatis foliosis, foliis carnoso-coriaceis teretibus superne canaliculatis obtusis grosse impresso-punctatis, floribus subsolitariis inter folia nidulantibus, calycis lobis brevissimis.—*Hook. Journ. Bot.* i. 255. (*Gunn*, 283.)

Hab. Highest parts of the Western Mountains, Arthur's Lakes, etc., elev. 3500–4500 feet, *Lawrence, Gunn.*—(Fl. Dec.)

A very singular species, quite unlike the former and following, forming a depressed shrub, that lies prostrate on the ground, and sends out straggling woody branches over stones, etc.—*Branches* 6–8 inches long, much divided, tuberculated with the scars of fallen leaves, terminal ones pubescent. *Leaves* crowded on the branches. ¼–½ inch long, spreading, cylindrical, with a deep groove down the upper surface, blunt, covered with glandular

dots. *Flowers* small, white, solitary, nestling amongst the leaves. *Ovaries* 4–6; *ovules* 2, superimposed, both ascending.—In more favourable localities than this species has hitherto been found in, it may be expected to have more flattened leaves, as the depth and breadth of the groove on the upper surface varies much.

3. **Phebalium? truncatum** (Hook. fil.); fruticosum, glaberrimum, ramulis pedunculisque puberulis, foliis brevissime petiolatis obcuneato-oblongis truncatis retusis grosse irregulariter spinoso-dentatis subtus glanduloso-punctatis, floribus ad apices ramulorum subcorymbosis, calyce brevissimo 4-lobo, petalis lanceolatis valvatis apicibus incurvis, staminibus 8, antheris didymis, filamentis alternis longioribus superne subincrassatis apice subulatis in cucullo antheræ insertis, ovario profunde 2-lobo 2-loculari, loculis 2-ovulatis, ovulis collateraliter suspensis ascendentibus. (*Gunn*, 1947.) (Tab. IX.)

Hab. Flinders' Island, in Bass' Straits, and Schouten Island, East Coast, *Gunn*.—(Fl. Oct. Nov.)

This is a very remarkable plant, differing in several points from *Phebalium;* but not being in fruit, I am unwilling to establish a new genus of it.—A small bush. *Stems*, and especially branches, covered with reddish bark, minutely puberulous towards the tips with simple or stellate hairs. *Leaves* scattered, $\frac{1}{2}$–$\frac{3}{4}$ inch long, coriaceous, oblong, but rounded at the base and truncate or emarginate at the apex, coarsely toothed, coriaceous, paler and dotted beneath. *Flowers* small, whitish, in small terminal erect cymes, hidden amongst the leaves. *Peduncles* and *pedicels* with silky pubescence. *Calyx* minute, four-toothed. *Petals* lanceolate, concave, valvate, with incurved tips, one-nerved. *Stamens* four, alternate ones shorter; filaments glabrous, filiform, rather thickened about the middle, apex subulate. *Anthers* shortly-oblong, with an arched protuberance over the apex of the filaments. *Pollen* globose. *Ovary* deeply two-lobed; lobes erect, with a few hairs at the tips, two-celled; cells with two collateral ovules adnate a little above the middle by broad bases. *Style* straight, erect, subulate. *Stigma* simple, minute. *Carpels* immature, one only ripening, oblong, with a rather narrowed recurved tip.—Plate IX. Fig. 1, 2, hairs from under surface of leaves; 3, flower; 4, the same opened; 5, stamens; 6, pollen; 7, ovarium; 8, vertical section of ovarium; 9, immature fruit; 10, the same magnified; 11, immature seed:—*all but fig.* 9 *magnified.*

Gen. III. ERIOSTEMON, *Sm.*

Omnia *Phebalii*, sed floribus tetrameris v. pentameris, staminibus plerumque petalis brevioribus, filamentis sæpissime villosis pilosisve, antherisque apice appendiculatis.

This, so far as its diagnostic characters are concerned, appears to be quite an artificial genus, the three points by which it is distinguished from *Phebalium* being trifling, and none of them absolute. These are—the stamens being generally shorter than the petals, the filaments being pilose, bearded, or villous, and the anthers having the connective produced beyond the cells into a small point. When taken together, however, these group a large number of plants, all different-looking from *Phebalium*, and they may therefore serve to establish the genus. About thirty species are known, all but one natives of extratropical Australia, chiefly of the West Coast. (Name from *εριον, wool,* and *στημων, a stamen.*)

1. **Eriostemon verrucosum** (A. Rich. Sert. Astrol. t. 26); grosse glanduloso-tuberculata, ramis virgatis, foliis coriaceo-carnosis obcordatis, filamentis planis ciliatis apice subulatis, antheris apiculatis.—*Hook. Journ. Bot.* ii. 417. E. obcordatum, *Hook. Journ. Bot.* i. 254, *Ic. Pl. t.* 60. (*Gunn*, 14.)

Hab. Common in sandy and gravelly soil throughout the Island, *Cunningham, etc.*—(Fl. Oct. Nov.) (*v. v.*)

A small, heathy shrub, 2 feet high, covered with granular tubercles, each full of essential oil, and with a depression at the summit.—*Stems* and *branches* green. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ inch long, very thick and somewhat fleshy, obcordate, glandular on both surfaces. *Flowers* numerous, solitary, axillary, $\frac{1}{2}$ inch across, pink, rarely white. *Pedicels* much shorter than the leaves. *Calyx-lobes* very small, rounded. *Petals* five, obovate-oblong. *Stamens* alternately shorter; filaments dilated, flat, ciliated or pilose, subulate at the tips. *Anthers* ovate, subcordate, with short apiculi.

2. **Eriostemon virgatum** (A. Cunn. MSS. Hook. fil. Journ. Bot. ii. 417); ramis ramulisque glan-

duloso-tuberculatis, foliis obcuneato-lanceolatis apice rotundatis v. mucronatis subtus pallidis glanduloso-granulatis punctatis, floribus tetrameris, pedicellis folio brevioribus, filamentis villosis, antheris subacutis, coccis apice producto recurvo. (*Gunn*, 485.)

Hab. Rocky shores of Macquarrie Harbour, *Cunningham;* Rocky Cape, *Gunn.*—(Fl. Nov.)

A slender species.—*Branches* tuberculated with prominent glands. *Leaves* obcuneate-lanceolate or linear-obovate, blunt or apiculate, $\frac{1}{2}$–$\frac{2}{3}$ inch long, coriaceous, smooth above, whitish below, there dotted with prominent glands. *Flowers* tetramerous, $\frac{1}{3}$–$\frac{1}{2}$ inch across, pink. *Stamens* with curved filaments, thickened and woolly above the middle, thence contracted into subulate glabrous apices. *Anthers* versatile, hardly pointed. *Carpels* (unripe) rather narrow, with recurved tips.—I have (Journ. Bot.) erroneously called this plant a native of Australia.

Obs. ***Eriostemon trinerve*** **(Hook. Journ. Bot. i. 254) is a species of** ***Leptospermum.***

Gen. IV. ZIERIA.

Calyx 4-fidus. *Petala* 4. *Stamina* 4, lobulis disci profunde lobati inserta; *filamentis* glabris; *antheris* cordatis, versatilibus. *Ovaria* 4, 1-locularia; *ovulis* 2, fere collateralibus. *Stylus* 1, brevis; *stigmate* capitato. *Capsula* 4-cocca; *coccis* 1-spermis.—Folia *opposita, simplicia v. trifoliolata.*

An Australian genus, of which rather more than a dozen species are known, chiefly natives of the east coast, one or two entering the Tropics. The only Tasmanian species is also a New South Wales one, and extremely variable in foliage.—*Shrubs* with opposite, simple, or trifoliolate leaves. *Calyx* small, four-lobed. *Petals* four. *Stamens* four; *filaments* glabrous, inserted in a deeply lobed disc; *anthers* cordate, versatile. *Ovaries* four; *ovules* two in each. *Style* short, simple, with a capitate stigma. *Capsule* of four cocci. (Named in honour of *M. Zier*, a German botanist.)

1. **Zieria lanceolata** (Brown, in Rees' Cycl.); fruticosa, ramulis paniculisque pubescentibus, foliolis lanceolatis elliptico-lanceolatisve utrinque acutis subtus puberulis glabratisve, paniculis trichotome ramosis folio æquilongis multifloris.—*DC. Prodr.* i. 723. Z. Smithii, *Andr. Bot. Rep. t.* 606 (*non Bot. Mag. t.* 1395). Z. arborescens, *Hook. Journ. Bot.* i. 256. (*Gunn*, 140.)

Hab. Common in rich soil, by the margins of streams, etc., throughout the Colony.—(Fl. Oct.) (*v. v.*)

Distrib. Western extratropical Australia. (Cultivated in England.)

There are certainly three nearly allied species of *Zieria*, all found in Eastern Australia: one has small flowers, and is found to the north of Sydney at Brisbane River and Stradbrooke Island, it is the *Z. macrophylla* of Delessert's Icones; the second, from Sydney itself, has tuberculated branches, and is the *Z. Smithii*, Sims, Bot. Mag. t. 1395; and the third, from South-eastern Australia, which I assume is the same as the Tasmanian plant, has smooth branches. and is figured by Andrews (Bot. Rep. l. c. sub nom. *Z. Smithii*). This latter differs from the description of *Z. arborescens* in Sims, Bot. Mag. (appended to that of *Z. Smithii*), in the leaves being punctate below.—A shrub, 4–9 feet long. *Branches* smooth, the ultimate ones pubescent. *Petioles* 1–1½ inch long. *Leaflets* 1–4 inches long, lanceolate, acute or acuminate, narrowed at both ends, glabrous above, paler and dotted below, sometimes pubescent. *Panicles* almost as long as the leaves, ternately branched, pubescent, many-flowered. *Flowers* white, $\frac{1}{4}$ inch diameter. *Carpels* **two or three only ripening, strongly nerved.**

Gen. V. BORONIA, *Sm.*

Calyx 4-fidus. *Petala* 4, imbricata. *Stamina* 8, alterna breviora interdum sterilia; *filamentis* glabris pilosisve. *Ovarium* 4-loculare; *ovulis* quovis loculo 2, superpositis. *Stylus* erectus, brevis; *stigmate* simplici. *Capsula* 1–4-cocca; *coccis* 1- rarius 2-spermis.—Fruticuli, foliis *oppositis, plerumque trifoliolatis pinnatisve, glanduloso-punctatis;* pedunculis 1-*multifloris;* pedicellis *sæpissime articulatis.*

Species of *Boronia* are amongst the most abundant plants in many parts of Australia and Tasmania; they are strong-smelling and almost invariably pink-flowered. All are extremely variable in habit and foliage, so that it is nearly impossible to limit the species. Fully sixty are known, and many more described; but an extensive series of specimens of any one species shows so many varieties, that it is obviously impossible to determine these from single individuals. Some of the pinnate-leaved species have occasionally trifoliolate and even simple leaves, what is the petiole in the one case being expanded into a blade in the other. These petioles being originally developed as leaves, and being identical in structure with the leaflets, which surmount them on the other parts of the plant, it becomes impossible to say what is a leaf and what not, either by inspection or study; the phenomenon not being at all analogous to the phyllodia of the Acacias. I must confess myself quite unable to detect absolute characters between the various Tasmanian pinnate-leaved species. Mr. Gunn depends much on the smell, habitat, habit, etc., and I have followed his determinations implicitly, except with regard to *B. nana*, which I have no hesitation in referring to *B. hyssopifolia.*—*Calyx* quadrifid. *Petals* four, imbricate. *Stamens* eight, alternate ones smaller; *filaments* glabrous or pilose. *Ovaries* four-celled, with one style and two superimposed ovules in each cell. *Fruit* of one to four one- rarely two-seeded cocci. (Named in honour of *F. Borone*, who attended Dr. Sibthorpe in his botanical travels in the Levant, etc.)

§ 1. *Folia simplicia* (*in* B. hyssopifolia *interdum trifoliolata*).

1. **Boronia rhomboidea** (Hook. Ic. Plant. t. 722); glaberrima, foliis rhombeo-obovatis sessilibus integerrimis crasse coriaceis, floribus sessilibus solitariis, filamentis glandulosis. (*Gunn*, 1946.)

Hab. North-west River (near Hobarton), and base of Western Mountains, *Gunn.*—(Fl. Nov.)

A small, woody, glabrous shrub.—*Branches* terete, divaricating. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ inch long, broadly obovate-rhomboid, sessile, quite entire, coriaceous, veinless, dotted on both surfaces, reddish at the petioles. *Flowers* large for the size of the plant, solitary, sessile, pink, $\frac{1}{3}$ inch diameter. *Sepals* ovate, one-third as long as the coriaceous glabrous petals. *Filaments* fleshy, studded with pedicelled glands, curved at the apex. *Anthers* oblong, didymous. *Ovary* deeply four-lobed, on a broad disc, suddenly contracted into the erect style; *stigma* minute, four-lobed.—The style very easily splits longitudinally into four pieces, corresponding to the carpels, and then each piece falls away, leaving a scar at the apex of each carpel.

2. **Boronia pilonema** (Lab. Nov. Holl. i. 98. t. 126); prostrata, ramulis erectis ascendentibusve, foliis lineari-oblongis lanceolatisve integerrimis acutis, floribus breve pedicellatis solitariis paucisve, filamentis glabris, seminibus parvis ovoideis atris nitidis punctulatis.—*DC. Prodr.* i. 722. (*Gunn*, 791.)

Hab. Common in heathy places on sandy soil, throughout the Island, *Labillardière, etc.*—(Fl. all summer.) (*v. v.*)

Distrib. South-eastern Australia.

A small glabrous species, entirely similar to the following, but distinguished by the glabrous filaments and shining black seeds.—*Stems* diffuse, ascending, or erect from the root, 3–8 inches long. *Leaves* simple, linear-lanceolate, acuminate, entire, $\frac{1}{2}$–$\frac{2}{3}$ inch long, coriaceous, nerveless. *Flowers* axillary or terminal, on stout pedicels, pink. *Stamens* glabrous, or very slightly hairy. *Seeds* black, shining, minutely dotted.—South Australian specimens have more shining, flatter seeds, hardly dotted, and long scattered hairs on the filaments.

3. **Boronia hyssopifolia** (Sieber, Pl. Exsicc. 296); humilis, ramis prostratis v. e radice erectis gracilibus, foliis simplicibus lineari-lanceolatis acuminatis, floribus terminalibus lateralibusve breviter pedicellatis, staminibus pilosis, seminibus oblongis opacis.—*Hook. Journ. Bot.* 255. B. tetrathecoides, *Hook. Comp. Bot. Mag.* i. 277; *an Persoon?* (*Gunn*, 458.)

Var. β; foliis trifoliolatis.—B. nana, *Hook. Ic. Pl. t.* 270; *Hook. Journ. Bot.* ii. 419. (*Gunn*, 894.)

Hab. Abundant throughout the Colony, in clay soil. Var. β. Rocky Cape, *Gunn.*—(Fl. throughout the summer.) (*v. v.*)

DISTRIB. New South Wales and South-eastern Australia.

So closely resembling the last, as to require no detailed description. The seeds are very large, oblong, and covered with a granulated opaque testa, glistening with minute copper-coloured points when dry. I cannot distinguish this from the preceding without the seeds, for the hairs on the filaments afford a very inconstant character. Dr. Müller has sent, from South-eastern Australia, what appears to be this species (under the name of *B. tetrathecoides*), with the leaves simple below, and trifoliolate above; whilst a few intermediate ones are lobed at the apex. As it is not in fruit I cannot identify it with the Tasmanian plant, or I should adopt the name *B. tetrathecoides* for the present. Also Dr. Müller sends the ordinary state of the plant, under the name of *B. tetrathecoides*, var. *simplicifolia*; and another with broad leaflets, and densely pubescent leaves and branches, as var. *pubescens*; no two species can well be more dissimilar than these varieties are, and I have no reason to doubt Dr. Müller's correctness; it only shows how much more good is to be done by studying the variations of these plants, than by describing different forms as new species. My var. β, again, only differs in having most of the leaves trifoliolate, a few of the lower being simple. I have not seen the seeds of it, but Gunn says of them, that they differ from those of all the other species but ***B. hyssopifolia***, which he rightly describes as opaque.

§ 2. ***Folia trifoliolata v. pinnata.***

4. **Boronia pilosa** (Lab. Nov. Holl. i. 97. t. 124); erecta, ramis ramulisque pubescentibus v. pilosis rarius glabratis, foliis brevibus impari-pinnatis, foliolis 2–5-jugis confertis linearibus acuminatis basi angustatis planis coriaceis canaliculatis, pedunculis brevibus.—B. tetrandra, *Hook. Journ. Bot., et Comp. Bot. Mag. l. c. non Labillardière.*

Var. *a*; ramulis albo-pubescentibus, petiolo communi foliolis brevioribus, foliolis anguste lanceolatis. (*Gunn*, 1039, 1039?)

Var. β. *floribunda*; pubescenti-pilosa v. glabrata, foliolis ut in *a* sed sæpe latioribus. (*Gunn*, 665.)

Var. γ. *laricifolia*; glabrata v. puberula, petiolo communi abbreviato, foliolis fasciculatis, floribus minoribus. (*Gunn*, 790.)

HAB. Abundant throughout the Colony. Var. *a*. Recherche Bay, Port Arthur, etc. Var. β. Hobarton, etc. Var. γ. Circular Head, Woolnorth, etc.—(Fl. Oct. to Jan.) (*v. v.*)

DISTRIB. New South Wales and South-eastern Australia.

I have adopted Mr. Gunn's limitations of the varieties of this species. I cannot define them better than as above. None of them belong to *B. tetrandra* of Labillardière, as was formerly supposed, which inhabits King George's Sound, and has never been found in Tasmania.—A small shrub, 1–3 feet high, with erect slender branches, which are more or less pilose. *Leaves* pinnate: common petiole very short, or sometimes $\frac{1}{2}$ inch long: *leaflets* two to four pair, linear-lanceolate, narrowed at both ends, straight or slightly curved, pilose or glabrous, $\frac{1}{8}$–$\frac{1}{2}$ inch long, $\frac{1}{6}$ inch broad, rarely broader; when the petioles are very much abbreviated, as in var. γ, the leaflets appear fascicled. *Flowers* abundant or few, shortly pedicelled, very variable in size, $\frac{1}{4}$ to nearly $\frac{1}{2}$ inch across the petals. *Sepals* ovate, subulate or lanceolate, puberulous or glabrous. *Stamens* eight; *filaments* ciliated.

5. **Boronia variabilis** (Hook. Comp. Bot. Mag. i. 277); erecta, glabra v. pubescens, ramis ramulisque pubescentibus plerumque pustulato-glandulosis, petiolis crassis teretibus planisve, foliolis oblongo- v. obovato-lanceolatis apices versus latioribus interdum obovato-spathulatis apice retusis bi-trifidisve grosse punctatis planis nervo distincto, floribus breviter v. longius pedicellatis.—*Journ. Bot.* ii. 418.

Var. *a*; foliolis obovatis submembranaceis obtusis retusis 2–3-fidisve. (*Gunn*, 666.)

Var. β; foliolis lanceolatis apices versus latioribus acutis mucronatis acuminatisve. (*Gunn*, 214.)

HAB. Northern parts of the Island, near the coast; Woolnorth, Hunter's and Flinders' Islands in Bass' Straits, *Gunn*.—(Fl. Oct.)

Distrib. New South Wales and South-eastern Australia.

A tall, handsome species, 2–4 feet high, exuding copiously a balsamic gum, that smells of turpentine and somewhat of Mangos (*Gunn*).—*Branches* and *branchlets* usually pubescent and covered with tubercles, each containing an oil-gland, but sometimes smooth. *Leaves* pinnate; *petioles* stout, $\frac{1}{2}$–$\frac{3}{4}$ inch long, often flat and dilated; *leaflets* two or three pair, more or less obovate-lanceolate or obovate-spathulate, membranous or coriaceous, their apices acute, blunt, rounded, retuse, or in broader leaflets bi-trifid, studded with large glands, very variable in length and breadth, $\frac{1}{3}$–$\frac{1}{2}$ inch long, generally with an evident prominent midrib. *Flowers* very numerous, pink, variable in size, similar to those of *B. pilosa*.—Narrow-leaved states closely resemble *B. anethifolia*, A. Cunn., of New South Wales. The membranous state of this, with spathulate, broad, retuse, or lobed leaflets, looks quite distinct from any of its congeners, but Gunn's suites of specimens show that it passes directly into the following; it is the *B. dentigera* of Dr. Müller, and is also found in South-eastern Australia.

6. **Boronia Gunnii** (Hook. fil.); glaberrima, erecta, ramis ramulisque lævibus, petiolis gracilibus, foliolis 2–4-jugis lineari-lanceolatis acutis acuminatisve planis enerviis obscure glanduloso-punctatis, floribus amplis.—B. tetrandra, γ grandiflora, *H.f. in Journ. Bot.* ii. 419. (*Gunn*, 8.) (Tab. X.)

Hab. Rocks on the South Esk River, near Launceston, *Gunn*.—(Fl. Nov. Dec.)

Everywhere glabrous, 2–4 feet high. *Branches* smooth, smelling powerfully of rue or tansy. *Leaves* numerous; *petioles* rather slender, $\frac{2}{3}$–1 inch long. *Leaflets* linear-lanceolate, flat, rather membranous, acute or acuminate, nerveless, obscurely glandular. *Flowers* large, often $\frac{2}{3}$ inch across, abundant, on rather long pedicels. *Filaments* pilose, glandular at the back towards the anthers. *Seeds* oblong, black.—Plate X. *A*. Leaf of the form figured. *B*. Of a specimen with shorter leaflets. Fig. 1, flower; 2, stamen; 3, pollen; 4, ovarium and disc; 5, longitudinal section of ovary; 6, young carpel; 7, longitudinal section of ditto; 8, ovules; 9, fruit; 10, ripe coccus; 11, vertical section of ditto; 12, seed; 13, section of ditto, showing the albumen in its membrane; 14, section of albumen, showing the embryo:—*all magnified.*

7. **Boronia citriodora** (Gunn, MSS.); erecta, glaberrima, v. ramulis lævibus puberulis, petiolis breviusculis crassis, foliolis 1–2-jugis lineari- v. obovato-lanceolatis acutis crassis coriaccis enerviis obscure punctatis, floribus breve v. longe pedicellatis.—B. variabilis *in part. Hook. Comp. Bot. Mag.* i. 277, *et Journ. Bot.* ii. 418. (*Gunn*, 667, 894?)

Hab. Common in alpine districts, in quartzy sand and peat, elev. 2–4500 feet: Black Bluff Mountain, Fatigue Hill, Lake St. Clair, Hampshire Hills, *Gunn*.—(Fl. Jan. Feb.) (Lemon plant.)

As handsome a species as *B. Gunnii*, but not so tall; it is very difficult to distinguish it from that plant, except by the strong and delicious smell of lemons, the fewer, far more coriaceous leaflets, and shorter petioles. Gunn observes that the seeds are larger and longer in this, but the difference is slight, and can only be detected by comparison. Gunn's 894? are small specimens of the same (as he suspects himself).

Gen. VI. ACRADENIA, *Kippist.*

Calyx 5–8-partitus. *Petala* 5 (rarius 4), imbricata. *Stamina* 8–10, alterna breviora; filamentis glabris. *Ovaria* 5, villosa, apice glandula instructa; ovulis 2, collateraliter pendulis. *Stylus* 1, erectus. *Capsula* 5-cocca, coccis compressis truncatis breviter cornutis rugosis, endocarpio non secedente.—Frutex 8–12-*pedalis*; foliis *oppositis, trifoliolatis, glanduloso-pustulatis*; floribus *cymosis, albis.*

A very remarkable plant, fully and well described and figured in the 21st volume of the Linnæan Transactions by Mr. Kippist, who established the genus, and of whose analysis I have availed myself in the generic and specific descriptions. (Name from *ακρος, the summit*, and *αδην, a gland*; in allusion to the gland on the apex of each carpel.)

1. **Acradenia Frankliniæ** (Kippist in Linn. Soc. Trans. xxi. 208. t. 22). (*Gunn.* 1038.)

Hab. Macquarrie Harbour and River, on the margins of streams, *Milligan, Gunn.*—(Fl. Oct.)

A shrub 8–12 feet high, glabrous, except the tips of the branches.—*Branches* stout, pustular. *Leaves* evergreen, opposite, shortly petiolate, trifoliolate; *leaflets* oblong-lanceolate, sessile, blunt, toothed towards the apex, covered with minute tubercles full of oil, shining, bright green. *Cymes* terminal, trichotomous, downy with short hairs, shorter than the leaves. *Flowers* pedicelled, white, ½ inch broad. *Calyx-lobes* five, small, rounded, fleshy. *Petals* four or five, velvety. *Stamens* eight to ten, filaments slender, glabrous, subulate. *Anthers* oblong. *Ovaries* five, on a sessile lobed disc, very villous, each terminated by a conspicuous gland; *ovules* two, collateral. *Style* one, erect.

Nat. Ord. XXIV. RHAMNEÆ.

About eighty Australian species of *Rhamneæ* are known; with very few exceptions all of them are extratropical. The great majority belong to the two genera *Cryptandra* and *Pomaderris*, or to their immediate allies. About an equal number are found on the East and West Coasts, and none are common to both. The West Coast species are by far the most peculiar, in so far as that all of them belong to genera confined to Australia, except *Pomaderris*, whereas the Asiatic genera *Ventilago*, *Colubrina*, and *Zizyphus*, and the South American genus *Discaria*, are all found on the North and East Coasts. There are only six or eight tropical Australian species, including several Asiatic *Zizyphi* and *Colubrinæ*, and there is also one tropical species of the Polynesian genus *Alphitonia*. Of the allied Natural Order *Celastrineæ* there are no Tasmanian species, but about a dozen Eastern and Tropical Australian.

Gen. I. DISCARIA, *Hook.*

Calyx breviter campanulatus, 4–5-fidus. *Petala* 4–5 v. 0. *Discus* carnosus, pateriformis, basin ovarii cingens, margine integro sublibero. *Capsula* basi calycis tubo circumdata, 3-loba, 3-locularis, loculis 1-spermis.—Frutices *spinescentes*; ramis *oppositis*; floribus *fasciculatis*.

This curious genus has hitherto only been detected in extratropical South America, the Galapagos Islands, New Zealand, Australia, and Tasmania; all the species form small, rigid, woody, almost leafless bushes.—*Flowers* fascicled. *Calyx* shortly campanulate, quadrifid or quinquefid. *Petals* four or five, or wanting. *Disc* fleshy, broad. *Capsule* surrounded with the persistent base of the calyx, three-lobed, three-celled; cells one-seeded. *Seeds* with a pale brown shining testa. (Name from δισκος, *a disc*; from the broad disc on which the ovary is seated.)

1. **Discaria australis** (Hook. Bot. Misc. i. 157, Journ. Bot. i. 256, Fl. N. Zeal. i. 47.)—Colletia pubescens, *Brongn. Ann. Sc. Nat.* x. 366. C. Cunninghamii, *Fenzl, Plant. Hügel.* 23. Tetraspora juncea, *Don, Syst. Gard.* ii. 35. (*Gunn*, 206.)

Hab. Not common; near Bagdad and on the road to Launceston, about thirty miles from Hobarton; also on the South Esk, twelve miles from Launceston, always on sandy or gravelly soil, *Gunn*; Great Swan Port, *Backhouse.*—(Fl. Nov.)

Distrib. New South Wales and South-eastern Australia; Northern and Middle Islands of New Zealand.

An ugly shrub, 2–3 feet high.—*Stems* green, irregularly branched, much browsed on by cattle and sheep. *Branches* opposite, often naked and leafless, and becoming strong spines 1–2 inches long. *Leaves* small, linear or oblong, fascicled in the axils of the branches, or absent, glabrous or pubescent. *Flowers* white, glabrous or pubescent, on short axillary peduncles. *Calyx-lobes* broadly ovate, reflexed. *Petals* reduced to concave scales. *Disc*

broad, with a narrow free edge. *Stigmas* three.—New Zealand specimens are apetalous, but otherwise undistinguishable from Tasmanian.

Gen. II. CRYPTANDRA, *Sm.*

Flores bracteolati, congesti. *Calycis tubus* conicus, campanulatus v. cylindricus, ovario accretus; limbi lobis 5, acutis, intus carinatis. *Petala* 5, parva, cucullata, persistentia. *Stamina* 5, petalis inclusa. *Ovarium* semi-inferum, apice villosum, 3-loculare, ovulis loculis solitariis erectis. *Stylus* simplex; stigmate simplici v. 3-lobo. *Capsula* calyce et corolla persistente terminata, 3-locularis, 3-cocca, coccis indehiscentibus v. 2-valvibus. *Semen* erectum, oblongum, obtuse trigono-compressum; testa lævi, coriacea. *Albumen* carnosum. *Cotyledones* magnæ, oblongæ; *radicula* brevi, infera.—Suffrutices *plerumque parvifolii;* foliis *glabris, pubescentibus lanatisve;* floribus *solitariis aggregatisve, squamis imbricatis calyculatis.*

I have had great difficulty in disposing of the species of the curious and difficult tribe of Australian *Rhamneæ*, to which *Cryptandra*, *Trymalium*, *Spyridium*, and *Pomaderris* all belong; for though placed under two sections by Reisseker, these are all undoubtedly closely-allied genera. In the first place, I have retained under *Pomaderris* only those species which agree with the original *P. elliptica*, in having no bracts to the flowers, stamens longer than the petals, and the cocci indehiscent, but with a large foramen on their ventral face. If *Trymalium* of Fenzl is to be kept distinct from these, it may be distinguished by the indehiscent imperforate cocci, for I cannot find any small foramen such as is alluded to by that careful author, except that at the base of the coccus, where it is inserted into the cavity of the calyx; the cocci are indeed perfectly similar to those of most *Cryptandræ*. Under *Cryptandra* I place a number of plants differing much in habit and floral characters, but which all agree in having bracteate flowers, stamens concealed within the petals, and imperforate cocci that either dehisce by the ventral suture, or, like those of *Trymalium*, are altogether imperforate and indehiscent. *Spyridium* (Fenzl) I include in the same genus, its cocci being indehiscent, flowers bracteate, and stamens concealed in the petals, and there being no other character by which it may be distinguished from many other *Cryptandræ*. The disc is as variable in this genus as in *Trymalium* and *Pomaderris*, being in some cases (*C. obovata*) extremely thick, swollen, and completely shutting up the throat of the calyx, allowing a passage for the style only; in others, again, the vertex of the ovary projects beyond the disc.

Woolly or tomentose shrubs, with alternate stipulate leaves and minute flowers, generally densely aggregated into capitula formed of many cymes with short branches.—*Flowers* surrounded with brown chartaceous bracts, which are reduced stipules of undeveloped leaves. *Calyx-tube* villous, tomentose, or pubescent, campanulate, tubular, funnel-shaped, or broadly obconic; lobes five, keeled inside. *Petals* five, minute, concave, sessile or clawed. *Stamens* small, included within the petals; filaments incurved. *Disc* very variable in size and relative position. *Ovary* half-inferior, its apex generally villous and exposed beyond the disc, three-celled; cells with one erect ovule. *Style* short or long. *Stigma* three-lobed. *Fruit* obovoid, surrounded with the membranous or crustaceous semi-adherent calyx, and persistent petals and stamens, of three cocci, which separate from one another and the calyx. *Cocci* dorsally convex and compressed, ventral surface slightly prominent and keeled, indehiscent or dehiscing down the mesial line internally, membranous, coriaceous, or crustaceous. *Seed* one, erect, compressed, lenticular; *testa* smooth, crustaceous or coriaceous. *Arillus* short, lobed (rarely none?). *Albumen* fleshy. *Embryo* in the axis of the albumen. *Cotyledons* large, parallel, oblong; *radicle* short. (Name from κρυπτος, *hidden*, and ανηρ, *a stamen;* in allusion to the concealed stamens.)

The subgenera of *Cryptandra* which I have proposed cannot be considered established till all the Australian species (of which there are very many) are examined. They are—

§ I. *Flowers* aggregated in abbreviated cymes. *Calyx* broadly obconic; tube not produced much, if at all, beyond the ovary. *Cocci* coriaceous or membranous, indehiscent, or perhaps dehiscing in a few species along the ventral suture.—To this belong the majority of the Tasmanian species: it is indeed quite a Southern form. About twenty species are known, five or six from South-west, eight or ten from South-east Australia. This

subgenus varies exceedingly in habit, breadth of leaves, in the amount of composition of the cyme, denseness of the inflorescence, number of bracts, presence or absence of white tomentose leaves subtending the cymes, and thickness, etc., of the disc.—Species 1–9.

§ II. *Flowers* solitary, or nearly so. *Calyx* broadly campanulate, tube produced far beyond the ovary. *Cocci* coriaceous, dehiscing along the ventral suture.—To this belong *C. pyramidalis* and *C. alpina* of Tasmania, besides about six Swan River and other Western extratropical species, and as many New South Wales and South-eastern Australian ones.—Species 10, 11.

§ III. This section, or probably genus, is at once distinguished by the tubular infundibuliform calyx, its tube produced far beyond the small ovary, and the stamens carried up the throat of the corolla a long way above the disc. *Cocci* crustaceous, bivalved.—In habit this entirely corresponds with many species of *Spyridium*. I know of only one species.—Species 12.

§ I. *Flores glomerati, capitati. Calycis obconici tubus ultra ovarium non productus. Ovarium fere inferum. annulo epigyno circumdatum.*

1. **Cryptandra obcordata** (Hook. fil.); procumbens, caulibus ramisque elongatis virgatis prostratis, ramulis foliosis furfuraceo-puberulis, foliis breve petiolatis obovato-obcordatis v. truncatis et retusis supra medium 1–2-dentatis v. integerrimis supra glabris subtus pallidis dense pubescentibus marginibus recurvis, cymis in capitula multiflora congestis, squamulis extimis pubescentibus interioribus scariosis margine villosis, coccis puberulis indehiscentibus. (*Gunn*, 1249.)

Hab. Trap hills on the banks of the Tamar; also abundant on the Asbestos Hills, *Gunn*.—(Fl. Oct.)

Forming large patches, 4–6 feet in diameter, appressed to the ground.—*Branches* terete, slender, very long, interlacing; *branchlets* leafy, covered with villous pubescence at the tips, and stellate pubescence lower down. *Leaves* $\frac{1}{6}$–$\frac{1}{3}$ inch long, on short, slender petioles, broadly obovate, obcordate, or truncate, and deeply emarginate or retuse, sometimes bifid at the apex, usually with one or two strong marginal teeth; margins recurved; upper surface bright green, glabrous, under pale, densely pubescent with villous hairs, pilose along the midrib. *Stipules* broadly ovate, with acuminate tips. *Flowers* small, in crowded capitula subtended by a few small leaves and surrounded by sheathing brown scarious bracts with villous margins; *bracts* blunt, outer pubescent at the back. *Calyx-tube* obconical. *Cocci* chartaceous, pubescent, compressed from back to front, keeled in front, obovate-oblong, apparently quite indehiscent. *Seed* conformable to the coccus, with a coriaceous shining testa.

2. **Cryptandra vexillifera** (Hook. Journ. Bot. i. 257); erecta v. prostrata, ramosa, ramis ramulisque virgatis pubescentibus, foliis lineari-oblongis lanceolatisve mucronatis acuminatisve marginibus revolutis superne canaliculatis subtus albo-pubescentibus, capitulis terminalibus densifloris foliis 1–2 longe petiolatis ellipticis albis subtensis, floribus minutissimis late obconicis, fructu calyce indehiscente tecto, coccis membranaceis late ovatis indehiscentibus. (*Gunn*, 16, 792.)

Hab. Northern parts of the Island; Woolnorth, Launceston, Port Dalrymple, etc., *Lawrence*, *Gunn*. (Fl. throughout the year.)

Distrib. South-eastern Australia.

A straggling undershrub, with prostrate or erect branches, nearly a foot high.—*Branchlets* slender, villous with rufous or white down. *Leaves* scattered, on slender short petioles $\frac{2}{3}$–1 inch long, rigid and coriaceous, linear- or oblong-lanceolate, rarely elliptical, acuminate or mucronate, margins revolute; upper surface polished, with a deep central groove, under densely covered with white or red down, midrib generally ferruginous. *Heads* of flowers as large as a peppercorn, terminal, brown from the number of closely imbricating scarious short orbicular bracts, subtended by one or two petiolate broad downy white leaves. *Flowers* very numerous and minute. *Calyx* broadly obconic, with a short tube and five spreading segments, villous externally. *Stamens* included in the cucul-

late petals. *Fruit* globular, covered with a brittle brown membranous perianth. *Cocci* broadly oblong, almost orbicular, much compressed from back to front, obscurely keeled in front, indehiscent; integument white, membranous, dotted. *Seed* conformable to the coccus; *testa* coriaceous.

3. **Cryptandra Lawrencii** (Hook. fil.); erecta, rigida, ramosa, ramis puberulis, ramulis tomentosis, foliis orbiculari-obovatis bullatis superne convexis velutinis subtus dense lanatis marginibus revolutis, capitulis multifloris parvis axillaribus terminalibusque dense lanatis, bracteis coriaceis calycibusque late obconicis dense villosis, fructu obovato calyce 3-partibili tecto, coccis indehiscentibus crustaceis. (*Gunn*, 1043.)

Hab. Swan River, near Great Swan Port (*Backhouse*), St. Paul's River (a tributary of the South Esk), forty or fifty miles south-east of Launceston, *Gunn*.

First discovered by Mr. Lawrence, but I do not know in what locality. It appears, from the specimens before me, to form a small prostrate or suberect shrub, 1–2 feet high.—*Branches* robust, tortuous, covered with black pubescent bark; *branchlets* velvety. *Leaves* spreading, petiolate, $\frac{1}{4}$ inch long and broad, broadly obovate-oblong, orbicular, or somewhat obcordate, very coriaceous, convex above, velvety, and with a deep central groove, margins very revolute, under surface densely woolly. *Capitula* small, $\frac{1}{3}$ inch across, densely woolly, sessile. *Flowers* immersed in coriaceous imbricated villous scales. *Calyx* broadly obconic, very villous with long hairs. *Stamens* included in the cucullate sessile petals, both inserted on a prominent disc. *Style* granular. *Fruit* obovate, covered with the closely adherent calyx, which splits into three, villous at the base and apex. *Cocci* oblong-obovate, rounded at the back, keeled in front, very coriaceous and almost crustaceous, apparently indehiscent.

4. **Cryptandra eriocephala** (Hook. fil.); erecta, virgata, ericoidea, ramulis pubescenti-tomentosis, foliis anguste lineari-subulatis aristato-acuminatis marginibus ad costam revolutis superne glaberrimis nitidis subtus albo-tomentosis, capitulis terminalibus subpedunculatis densifloris bracteis scariosis tectis albo-tomentosis, floribus parvis, calyce late obconico villoso, fructu calyce indehiscente tecto, coccis membranaceis indehiscentibus.—Spyridium eriocephalum, *Fenzl, Plant. Hügel.* 24. (*Gunn*, 1044.)

Hab. Banks of the Derwent (*Ferd. Bauer*), in dry places from above Hobarton to Glen Leith; South Esk, thirty miles from Launceston, *Gunn*.—(Fl. Oct. Nov.) (*v. v.*)

A small heath-like bushy shrub, 2–3 feet high, with erect branches and twiggy branchlets, thickly covered with appressed down.—*Leaves* $\frac{1}{3}$–$\frac{2}{3}$ inch long, scattered, shortly petiolate, rigid, almost pungent, narrow linear-subulate, or elliptical-lanceolate, acuminate, margins revolute to the midrib, rarely recurved, when the leaves are broader; upper surface deep green, shining, glabrous; under covered with white wool, but generally concealed by the revolute margins. *Capitula* terminal, often stalked, the peduncles woolly, size of a peppercorn or pea, brown from the many imbricated scarious shining bracts, white at the tip from the villous hairs of the flowers almost concealing them. *Calyx* very shortly obconic, broad, densely villous; segments with a very prominent keel on the inner face. *Stamens* concealed in the cucullate petals. *Style* granular on the surface. *Fruit* broadly obovoid, covered with the indehiscent, almost crustaceous calyx-tube. *Cocci* very broad, almost orbicular, much compressed, white, membranous, indehiscent. *Seed* with a hard crustaceous testa, mottled with red and brown.—This closely resembles a New South Wales species (from the Euryalean scrub, *A. Cunningham*) that has a scabrous or pubescent upper surface of the leaves.

5. **Cryptandra ulicina** (Hook. Journ. Bot. i. 257); frutex erectus ramosus foliosus, ramis ramulisque tomentosis virgatis, foliis ramulis lateralibus abbreviatis confertis linearibus obtusis v. superne dilatatis retusis furcatis bifidisve superne glabris subtus albo-tomentosis, capitulis sessilibus axillaribus terminalibusque paucifloris, floribus majusculis sericeo-tomentosis, calyce late obconico. (*Gunn*, 150.)

Hab. Common on the banks of the Derwent above New Norfolk, and at Launceston; also on the summit of Mount Wellington, *Lawrence, Gunn*.—(Fl. Oct.) (*v. v.*)

A very handsome species, forming a bush 4–8 feet high by the banks of streams, of a bright green colour, pow-

dered with its abundant white flowers, smelling like Hawthorn.—*Branches* tomentose, twiggy. *Stipules* broad, sheathing. *Leaves* crowded on short lateral branches, $\frac{1}{3}$–$\frac{1}{4}$ inch long, linear, very narrow, blunt (rarely acute), often dilated towards the extremity, and there retuse, bifid or forked, above glabrous, deep green, and channelled down the middle, margins revolute; under surface covered with white wool. *Flowers* two to six, in small capitula, rarely solitary (large for the genus), $\frac{1}{4}$ inch long, surrounded with brown scarious imbricating bracts. *Calyx* silky, its tube short, somewhat produced above the ovary; *limb* spreading. *Petals* spathulate, clawed. *Filaments* long; *anthers* included in the petals. *Style* rather slender, granular on the surface. *Fruit* unknown.—In young specimens both surfaces of the leaves are covered with white pubescence.

6. **Cryptandra Gunnii** (Hook. fil.); frutex, ramulis tomentosis, stipulis magnis ovatis carina pubescente, foliis coriaceis petiolatis ovato- v. elliptico-oblongis obtusis emarginatisve supra glabris impresso-venosis subtus albo- v. rufo-tomentosis marginibus subrecurvis, capitulis terminalibus laxiusculis foliis 2–3 albis stipatis, bracteis paucis flores vix involucrantibus, calyce tomentoso villoso late obconico, disco magno, coccis calyce subcrustaceo tectis late ovatis crustaceis puberulis. (*Gunn*, 1948.) (Tab. XI.)

Hab. Banks of the Franklin River, near Macquarrie Harbour, *Gunn.*—(Fl. Feb.)

A tall bush, 5–8 feet high.—*Branches* rather stout, terete, densely tomentose. *Stipules* large for the size of the leaves, $\frac{1}{5}$ inch long, ovate or obliquely ovate, lanceolate, scarious, brown, with a stout pubescent midrib, often produced into an acuminate apex. *Petioles* tomentose, as long as or longer than the stipules. *Leaves* $\frac{3}{4}$–1 inch long, ovate-oblong, rounded at both ends, blunt or emarginate at the apex, glabrous above, with impressed veins, densely tomentose below, margins slightly recurved. *Cymes* terminal, aggregated into very loose few-flowered capitula, the branches of which are evident amongst the flowers, densely tomentose, and bear white elliptical ovate-tomentose leaves. *Flowers* small; bracts ovate-acuminate, with midribs like the stipules. *Calyx-tube* very short, obconical, villous. *Petals* cucullate, clawed. *Stamens* included in the petals. *Disc* very thick, five-lobed. *Style* short, entire. *Fruit* woolly, obovoid, $\frac{1}{5}$ inch long. *Cocci* crustaceous or coriaceous, compressed, whitish, broadly ovate, keeled down the front, enclosed in the somewhat crustaceous calyx.—Plate XI. Fig. 1, floral leaf and two stipules; 2, flower; 3, vertical section of flower, showing the ovules; 4, petal and stamen; 5, pollen; 6, ovules; 7, ripe fruit; 8, transverse section of the same; 9, the same with part of the calyx removed; 10, cocci; 11, vertical section of ditto, showing the seed; 12, section of seed, showing the albumen; 13, section of albumen, showing the embryo:—*all magnified.*

7. **Cryptandra mollis** (Hook. fil.); fruticulus erectus molliter velutino-tomentosus, ramis dense villoso-tomentosis, foliis breve petiolatis late obovato-oblongis coriaceis obtusis emarginatisve superne molliter velutino-tomentosis inter nervos laterales parallelos bullatis marginibus recurvis subundulatis subtus molliter lanuginosis, cymis terminalibus congestis foliis albidis subtensis ramulis tomentosis, bracteolis paucis acutis, floribus parvis, calycibus densissime villosis, coccis late oblongis compressis. (*Gunn*, 1949.)

Hab. Flinders' Island and Cape Barren Island, in Bass' Straits, *Gunn.*—(Fl. Oct.)

Distrib. Mount Lofty, South Australia.

This appears to be a very small erect bush, 6–18 inches high, with slender, twiggy, rather tortuous branches; *branchlets* covered densely with somewhat floccose tomentum. *Stipules* subulate. *Leaves* spreading, rather small, grey-green, $\frac{1}{5}$–$\frac{1}{3}$ inch long, on short petioles, broadly ovate-oblong or obovate-oblong, rounded at both ends, blunt or retuse at the apex, margins somewhat recurved; upper surface with a deep central groove, and six or eight parallel lateral ones, between which the surface is convex, densely and softly velvety; under surface concave, with prominent nerves, densely covered with soft whitish tomentum. *Cymes* congested into branched depressed terminal capitula, subtended by several white leaves, similar to the cauline ones. *Flowers* minute, villous. *Calyx-tube* very short. *Petals* cucullate, enclosing the anthers. *Style* short, erect, undivided. *Cocci* broadly ovate, dorsally compressed, pilose towards the apex, with a mesial ridge in front, apparently indehiscent.

8. **Cryptandra? parvifolia** (Hook. fil.); fruticulus, ramulis gracilibus tomentosis, foliis parvis

obovatis obtusis supra glabris bullatis subtus incano-tomentosis villosisve marginibus recurvis integerrimis, cymis laxe congestis terminalibus foliis albidis late orbiculari-oblongis retusis emarginato-bilobisve subtensis, bracteolis paucis villosis, calyce obconico dense villoso sericeo, ovarii apice nudo villoso, fructu ignoto.—Pomaderris parvifolia, *Hook. Journ. Bot.* 257; *Fenzl, in Plant. Hügel.* 22.

Hab. Near Launceston? *Lawrence.*

Distrib. Bass' Straits (*Bynoe.*)

I have only seen two small specimens of this species; and though these have no fruit, I have little hesitation in referring it to the neighbourhood of *C. mollis*, with which it perfectly agrees in habit and structure of the cymes and flowers. Apparently a small species.—*Branches* terete, rather slender, densely tomentose, with ferruginous or whitish wool. *Leaves* small, $\frac{1}{4}$–$\frac{2}{3}$ inch long, shortly petioled, obovate, blunt or rarely emarginate; upper surface glabrous, with impressed veins; under densely tomentose, with prominent veins, margins recurved; *petiole* slender. $\frac{1}{10}$ inch long; *stipules* ovate-subulate. *Cymes* small, branched, each branch bearing a few flowers which are seated between the stipules of a broadly orbicular-obovate or obcordate emarginate or bilobed white leaf. *Bracteoles* three to five, broadly ovate, villous on the back. *Calyx* obconic, short, very villous. *Petals* cucullate, including the stamens. *Disc* very sinuous, five-lobed. Apex of *ovary* exposed, tomentose. *Style* short, with a three-lobed stigma. *Fruit* unknown.

9. **Cryptandra obovata** (Hook. fil.); frutex, ramulis erectis dense cano-tomentosis, foliis coriaceis obovatis v. obovato-oblongis junioribus rufo-tomentosis petiolatis coriaceis superne cano-pubescentibus glabrisve subtus dense appresse tomentosis marginibus planis recurvisve, nervis subtus prominulis v. 0, floribus in cymos axillares terminalesque dense congestis foliis 1–2 parvis stipatis, calyce obconico, disco crasso ovarium velante, fructu ignoto.—Pomaderris obovata, *Hook. in Comp. Bot. Mag.* 277, *Journ. Bot.* ii. 420; *Fenzl, En. Plant. Hügel. p.* 22. (*Gunn,* 460.)

Hab. East coast, Prosser's River at Spring Bay, *Backhouse.* St. Paul's River, etc., *Gunn.*—(Fl. Dec.)

A shrub 6–7 feet high.—*Branches* robust, suberect, terete; *branchlets* densely covered with white or ferruginous tomentum, as are the young leaves and capitula. *Leaves* coriaceous, $\frac{1}{2}$–$\frac{3}{4}$ inch long, shortly petioled, obovate, blunt, retuse or emarginate, pubescent or glabrous and shining above, below densely tomentose, margins plane or recurved. *Capitula* dense, many-flowered, axillary and terminal, as large as a pea, on stout densely tomentose branches, lobed, the branches seldom elongated or visible amongst the flowers. *Bracteolæ* broadly ovate, three or four to each flower. *Calyx* obconic, densely villous, segments spreading. *Petals* cucullate, enclosing the anthers. *Disc* very broad and thick, closing the whole mouth of the calyx, so that the ovary is wholly concealed, and the style projects through a narrow opening.—The latter is the best character whereby to recognize this from its allies; for though the leaves are very different-looking from those of *C. parvifolia* and *C. mollis*, it is not easy to distinguish them by words. The present plant resembles *Correa alba* in pubescence, but the leaves are sometimes quite glabrous above. Gunn says that it is common on the east coast.

§ II. *Flores solitarii (rarius bini). Calyx campanulatus, tubo lato, ultra ovarium producto. Ovarium fere superum, longe infra medium calyce accretum.*

10. **Cryptandra Sieberi** (Fenzl, Plant. Hügel. p. 23); fruticulus ramosus rigidus, ramulis breviusculis strictis divaricatis interdum spinescentibus incano-pubescentibus, foliis glabris parvis sparsis lineari-oblongis subacutis marginibus planis recurvisve, floribus sparsis brevissime pedicellatis basi squamis brevissimis arcte imbricatis, calyce campanulato-tomentoso, ovario $\frac{1}{4}$-infero, coccis 3 sutura ventrali dehiscentibus calyce indehiscente tectis.—C. amara, *Hook. Journ. Bot.* i. 258, *non Sm?* (*Gunn,* 1047.)

Hab. North Esk River, eight miles above Launceston, *Lawrence, Gunn;* Bagdad, *Miss Forster.*—(Fl. Oct.)

Distrib. New South Wales.

A small, wiry, scrubby shrub, 6 inches to a foot high, sparingly leafy.—*Branches* woody, lateral ones spreading, rigid, often becoming spinous at the tips. *Leaves* $\frac{1}{4}$–$\frac{1}{6}$ inch long, scattered, linear-oblong or linear-obovate, blunt, glabrous on both sides, margins flat or recurved. *Flowers* solitary, scattered, on short curved tomentose peduncles, surrounded at the base by short orbicular glabrous brown imbricating bracts, not one-quarter the length of the calyx. *Calyx* broadly campanulate, suddenly contracted at the very base within the bracts, $\frac{1}{6}$ inch long, densely pubescent externally. *Petals* obovate-spathulate, clawed. *Stamens* included in the petals; *filaments* adnate to the calyx, and forming prominent ridges on its inner surface. *Ovary* broad, short, almost wholly superior, densely villous with white spreading hairs. *Style* erect, rather long, granular. *Fruit* $\frac{1}{4}$ inch long, obovoid, surrounded with the persistent indehiscent calyx, which is adnate for one-quarter of the length of the fruit. *Cocci* coriaceous, pubescent, dehiscing along the ventral suture. *Seed* with a broad fleshy three- or four-lobed arillus.

11. **Cryptandra alpina** (Hook. fil.); fruticulus humilis depressus ramosus, ramulis tenuibus, foliis minimis sparsis petiolatis lineari-oblongis acutis obtuse trigonis, floribus terminalibus solitariis subsessilibus, bracteis late orbiculatis calycis $\frac{1}{3}$ longitudine æquantibus imbricatis, calyce late campanulato basi lobato tomentoso, ovario $\frac{1}{4}$-infero dense tomentoso, coccis 3 sutura ventrali dehiscentibus calyce indehiscente tectis. (*Gunn*, 716.) (Tab. XII. *A.*)

Hab. Summit of the Western Mountains, elev. 3800 feet, *Gunn.*—(Fl. Feb.)

A remarkable little species, closely related to the preceding, but very distinct. Remarkable for its small size, prostrate habit, slender puberulous branchlets, and minute leaves: the latter are $\frac{1}{16}$–$\frac{1}{8}$ inch long, trigonous, linear-oblong, acuminate or acute, green, quite glabrous. *Flowers* and *fruit* quite similar to those of the *C. Sieberi*, but the bracts are considerably larger and acute or mucronate.—Plate XII. *A.* Fig. 1, leaves; 2, flower; 3, the same with the bracts removed; 4, vertical section of ditto; 5, petal and stamen; 6, vertical section of ovary—*all magnified.*

§ III. Stenocodon, H.f.—*Flores glomerati. Calycis tubus longe tubuloso-infundibuliformis, basi supra ovarium parvum inferum constrictus.*

12. **Cryptandra pimeleoides** (Hook. fil.); fruticulus prostratus, ramulis crassiusculis pubescentibus, stipulis subulatis, foliis petiolatis obovatis v. obovato-obcordatis supra glabris subtus albo-tomentosis, capitulis densifloris foliis obcordatis 1–2 albis subtensis, bracteis scariosis obovatis externis aristatis, calycis tubo elongato membranaceo sericeo-villoso, petalis unguiculatis, antherarum loculis inferne divaricatis, filamento plano, coccis bivalvibus. (*Gunn*, 1041.) (Tab. XII. *B.*)

Hab. East coast, Kelvedon, at Great Swan Port, *Backhouse.* Spring Bay, *Gunn.*—(Fl. Dec.)

This will probably prove a new genus, for which I have proposed the name *Stenocodon*, from στενος, *narrow*, and κωδων, *a bell;* in allusion to the slender perianth.—A prostrate, small, woody, much branched plant. *Branches* short, pubescent. *Stipules* with small broad scarious bases, and long subulate apices. *Leaves* $\frac{1}{5}$–$\frac{1}{3}$ inch long, petiolate, obovate or obcordate, glabrous above, white with appressed down beneath. *Capitula* many and dense-flowered, terminal, $\frac{1}{3}$–$\frac{3}{4}$ inch across, depressed, subtended by one or more white petioled leaves, that are downy on both surfaces. *Bracts* numerous, variable in size and shape; outer broader, with long apices; inner obovate, blunt. *Flowers* $\frac{1}{5}$ inch long, with long slender tubular membranous calyces, contracted above the small inferior ovary, very silky externally. *Ovary* obovoid, much contracted at the base. *Petals* clawed, situated at the mouth of the calyx far above the ovary. *Filaments* flat, short, incurved at the apex; *anthers* of two cells, which are narrowed and divergent below. *Style* long, slender. *Cocci* bivalvular, crustaceous. *Seeds* not seen.—Plate XII. *B.* Fig. 1, bud and bract; 2, flower; 3, the same laid open; 4, petal; 5 and 6, stamens; 7, transverse, and 8, vertical, section of ovary:—*all magnified.*

Gen. III. POMADERRIS, *Lab.*

Flores ebracteati. *Calycis tubus* obconicus; limbi lobis patulis, medio carinatis. *Petala* 0 v. 5, unguiculata, parva, cucullata. *Stamina* 5, petalis non inclusa, filamentis erectis filiformibus. *Ovarium* 3-loculare, vertice villoso. *Stylus* plerumque trifidus, lobis 3 divergentibus; stigmatibus capitatis. *Capsula* calyce semiadnato inclusa, 3-cocca; *coccis* ut in *Cryptandra*, sed facie ventrali infra medium late aperta, indehiscentibus; semina ut in *Cryptandra*.—Frutices *v.* arbores *parvæ;* foliis *alternis, stipulatis*; floribus *cymosis.*

I have under *Cryptandra* pointed out the differences between that genus and the present. There are at least twenty species of *Pomaderris* known, chiefly inhabitants of the extratropical parts of Eastern Australia: two of these are natives of New Zealand also; and a third, from the same coast, is the only other that has been found out of Australia. (Name from *πωμα, a covering*, and *δερρις, the skin;* in allusion to the ripe capsules being loosely invested by the tube of the calyx.)

1. **Pomaderris elliptica** (Labill. Nov. Holl. i. 61. t. 86); tota cinereo-velutina, foliis petiolatis ellipticis utrinque obtusis v. apice subacutis superne glabris subtus albidis, cymis densifloris paniculatis, calycibus pedunculisque incano-velutinis pilosisque, petalis spathulatis unguiculatis, stigmatibus globosis sessilibus.—*DC. Prodr.* ii. 33; *Fl. N. Zeal.* i. 46; *Hook. Journ. Bot.* i. 256, ii. 420. (*Gunn,* 440.)

Hab. Common, especially in the northern part of the Island, *Labillardière, etc.*—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales. Northern Island of New Zealand.

A large shrub, 6–8 feet high, much branched and spreading, covered with blossom in November.—*Branches* stout, densely covered with yellowish or reddish tomentum. *Leaves* 2–3 inches long, oblong or ovate-oblong, blunt or sharp, coriaceous, flat, veined and glabrous above, rounded at the base, densely covered with white or reddish appressed down; nerves beneath distinct. *Petiole* ½–1 inch long. *Cymes* terminal and lateral, copious, many-flowered, 2–4 inches across. *Branches* and *branchlets* densely tomentose; *pedicels* and *calyx* downy, and also covered with silky long hairs. *Flowers* ⅕ inch across, yellowish or yellowish-white. *Stamens* longer than the calyx; *filaments* erect; *anthers* linear-oblong.—There is possibly some confusion between this species and the following, which is very nearly allied indeed, and possibly not specifically distinct; this, which grows chiefly in the northern parts of the Colony, has silky hairs on the calyx, as well as an appressed down: the following, which is more abundant in the southern parts, has no silky hairs, only the tomentum, which is more lax and furfuraceous. Labillardière describes the calyx as pilose, by which he perhaps means tomentose, for he gathered his specimens in the southern part of the Island. Ventenat's *P. discolor* appears to me to be the following, though Planchon (who first pointed out their differences to me) refers (in Herb. Hook.) Ventenat's *discolor* to Labillardière's *elliptica*. The figure in the 'Botanical Magazine' (t. 1510) quoted by De Candolle under *P. elliptica*, Lab., is not sufficiently exact to satisfy me as to which it represents. Fenzl, Plant. Hügel. p. 21, refers De Candolle's *discolor* and the Bot. Mag. *elliptica* to *multiflora* of Sieber, and retains both *elliptica*, Lab., and *discolor*, Vent., as distinct.

2. **Pomaderris discolor** (Vent. Malm. t. 58); omnia *P. ellipticæ*, sed pedicellis calycibusque furfuraceo-tomentosis non pilosis.—*DC. Prodr.* ii. 33. P. malifolia, *Sieber.*

Hab. Common, especially in the southern parts of the Island, *Gunn, etc.*—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales. (Cultivated in England.)

So similar to the *P. elliptica* (under which I have pointed out its differences) as to require no detailed description.—*Fruit* turbinate, about ⅕ inch long, half immersed in the persistent calyx-tube. *Cocci* three, crustaceous, mucronate, with a large opening extending in front from above the middle to the base.

3. **Pomaderris ferruginea** (Fenzl in En. Plant. Hügel. 21); ramulis cymis foliisque subtus molliter

tomentosis et pilosis, foliis oblongo- v. elliptico-lanceolatis subtus albo- v. rufo-tomentosis, cymis terminalibus multifloris laxis densisve, calycibus sericeo-villosis, stylo trifido.—*Sieb. Pl. Exsicc.* 214, 209. (*Gunn*, 440?)

Hab. Flinders' Island, in Bass' Straits, *Gunn.*

Distrib. New South Wales.

Very similar indeed to *P. elliptica*, but the branchlets, cymes, and leaves beneath are covered more or less with long soft hairs, and the cymes are generally more lax, and smaller. The flowers appear to be the same, except that the calyx is villous. Gunn's specimens are indifferent, and in fruit only; the leaves are broader, blunter, and the tomentum beneath more appressed and whiter than in Australian specimens, being thus as it were intermediate between *P. elliptica* and *P. ferruginea.*

4. **Pomaderris apetala** (Lab. Nov. Holl. i. 52. t. 87); frutex erectus, ramulis foliisque junioribus dense furfuraceo-lanatis v. appresse tomentosis, foliis ovato-lanceolatis oblongisve petiolatis acutis irregulariter dentatis basi rotundatis superne glabris scabridis vel rugosis subtus dense lanatis nervis prominulis, cymis paniculatis foliosis lanatis, calycibus stellato-pubescentibus, petalis 0, stylis supra medium distinctis. —*Hook. Journ. Bot.* i. 256, ii. 420. P. aspera, *Sieb. Pl. Exsicc.* 211; *DC. Prodr. l. c.*

Var. *α*; foliis lanceolatis superne glabris subtus ramulisque dense appresse albo-tomentosis. (*Gunn*, 126.)

Var. *β*; foliis oblongis v. oblongo-lanceolatis superne glabris rugosisve subtus rufo-tomentosis ramulisque floccosis. (*Gunn*, 1040.)

Var. *γ*; foliis oblongis obtusis supra scabridis rugosisque, subtus ramulisque albo- v. niveo-tomentosis. (*Gunn*, 1039.)

Hab. Abundant throughout the Island. Var. *α*. Everywhere. Var. *β*. On the banks of the Derwent above Hobarton. Var. *γ*. North Coast.—(Fl. Oct. to Dec.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

An extremely common and variable shrub, 3–6 feet high, more or less covered on the branches, petioles, under surface of the leaves, and cymes with an appressed or rarely floccose, dense, white or rufous tomentum, mixed with stellate hairs.—*Leaves* petiolate, varying from oblong to lanceolate-ovate, always rounded at the base, acute, coriaceous, 2–5 inches long, toothed or nearly entire; upper surface glabrous and smooth or pubescent, scabrid and rugose with impressed nerves, that are generally very prominent on the under surface. *Cymes* numerous, many-flowered, abundant towards the terminations of the branchlets, and together forming a cymose panicle, its branches and branchlets densely covered with white or buff-coloured furfuraceous or appressed tomentum. *Calyx-tube* obconic, tomentose, and covered with stellate hairs, or rarely nearly glabrous; segments spreading. *Petals* none. *Stamens* exserted. *Anthers* oblong. *Style* rather short, divided above the middle into three capitate spreading stigmata, woolly at the base. *Fruit* small, obconic, half sunk in the persistent lower half of the calyx-tube. *Cocci* white, crustaceous, as in *P. elliptica*, but hardly acute. *Seed* lenticular, compressed.

5. **Pomaderris racemosa** (Hook. Journ. Bot. 256); apetala, foliis parvis ($\frac{3}{4}$-pollicaribus) petiolatis ovato-oblongis utrinque rotundatis inferne ramulisque ferrugineo- v. albo-tomentosis integerrimis crenatisve, cymis parvis axillaribus lateralibusque paucifloris furfuraceo-tomentosis.—*Comp. Bot. Mag.* i. 277.

Hab. Launceston? *Lawrence, Gunn.*

Apparently a small shrub, of whose habit and locality I have no particulars.—*Branches* slender, erect, densely covered with rufous or white tomentum. *Leaves* petiolate, $\frac{3}{4}$ inch long, elliptical or ovate-oblong, obtuse, rounded at both ends, coriaceous, entire or toothed, with a deep central channel, and the lateral nerves marked by parallel depressed lines, glabrous above, beneath and along the margins tomentose or furfuraceous (as are the branches). *Stipules* subulate. *Cymes* small, axillary, ten- to twenty-flowered, when in flower scarcely longer than the leaves, leafless; peduncle elongated after flowering. *Calyx-tube* obconic, lobes spreading. *Petals* none. *Stamens* exserted;

filaments oblong. *Style* three- (rarely four-)cleft at the summit. *Fruit* obconic, girt at the middle by the persistent calyx-lobes. *Cocci* as in *P. elliptica*.

6. **Pomaderris ericæfolia** (Hook. Journ. Bot. i. 257); fruticulus apetalus erectus ramosus scoparius velutino-pubescens v. villosus, ramulis villosis, foliis parvis confertis patulis lineari-oblongis obtusis breve petiolatis superne scabridis marginibus ad costam revolutis, floribus parvis in cymas abbreviatas paucifloras axillares aggregatis.—*Fl. N. Zeal.* i. 46. (*Gunn*, 231.)

Hab. Mersey River, *Gunn*.

Distrib. Northern Island of New Zealand.

I have very few Tasmanian specimens, but they are absolutely identical with the New Zealand plant, which I have gathered abundantly.—A small, erect shrub, 2–3 feet high, with erect, fastigiate, broom-like branches, densely villous with spreading hairs. *Leaves* $\frac{1}{3}$–$\frac{2}{3}$ inch long, abundant, linear or linear-oblong, blunt, scabrid above, villous on both surfaces, most so below, margins revolute generally to the costa; petiole very short. *Stipules* subulate, almost filiform. *Flowers* in small, axillary, few-flowered cymes, which are scarcely longer than the leaves, and very abundantly produced along the branchlets. *Calyx* villous. *Petals* none. *Stamens* exserted. *Anthers* shortly oblong. *Style* three-cleft. *Fruit* unknown.—In New Zealand specimens the leaves become more expanded, their margins only recurved, and exposing the woolly under surface of the leaf. Fenzl (Plant. Hügel. p. 23) says of this that it is too nearly allied to *P. phylicæfolia*, Lodd. (Bot. Cab. 120).

Nat. Ord. XXV. STACKHOUSIEÆ.

The affinities of this curious Order are considered to be with *Euphorbiaceæ* on the one hand and *Celastrineæ* on the other; differing from *Euphorbiaceæ* in the erect seeds, hermaphrodite flowers, and indehiscent carpels. From *Celastrineæ* they differ in having stipules, in the claws of the petals being united, and in the want of a disc: these characters seem to me of less importance than those separating *Stackhousieæ* from *Euphorbiaceæ*, as they are all found in the Order *Rhamneæ*, except the absence of a disc, which is often present in *Euphorbiaceæ*. About fifteen or twenty Australian species are known (but these are so variable that they will probably be reduced), chiefly natives of the south-west coast, where the curious genus *Tripterococcus* (of which there are four species) occurs, along with six or seven *Stackhousieæ*. A few of the latter genus are tropical; one species of *Stackhousia* is found in New Zealand, and there is perhaps also a Philippine Island one, of which however I have seen very indifferent specimens.

Gen. I. STACKHOUSIA, *Sm.*

Calycis tubus ventricosus; limbus 5-partitus. *Petala* 5, unguiculata, linearia, unguibus liberis v. in tubum coalitis, limbo patente. *Stamina* 5, calyce inserta; filamentis 2 alternis longioribus. *Ovarium* 3–5-lobum, 3–5-loculare; *ovulis* solitariis, erectis. *Styli* 3–5, in unum apice 3–5-fidum coaliti. *Fructus* 3–5-coccus; *coccis* indehiscentibus, crustaceis; *semen* solitarium, erectum. *Embryo* in axi albuminis carnosi erectus, radicula infera.—Herbæ; foliis *linearibus obovatisve, integerrimis, alternis;* stipulis *parvis;* floribus *spicatis*.

Of this genus there are four Tasmanian species, some of which are far from well marked, and one of them is very common in open, dry places. All form erect herbs, with stems branching from the root only.—*Leaves* rather fleshy, alternate, sessile, stipulate, entire, linear or spathulate. *Flowers* sessile, forming dense or lax spikes at the ends of the branches, bracteolate. *Calyx* small, short, broadly campanulate, five-lobed. *Petals* five, seated on the throat of the calyx, with long, erect, free or connate claws, and small spreading limbs. *Stamens* five, two

alternate filaments longer than the others. *Ovary* three- to five-lobed, with as many cells, and a style divided above into as many stigmatiferous lobes. *Ovules* solitary in the cells, erect, anatropous. *Fruit* of three to five crustaceous, indehiscent cocci, separating from a central axis. *Cocci* one-seeded. *Seed* erect; testa membranous. *Albumen* fleshy. *Embryo* straight, with the radicle towards the hilum. (Named in honour of *J. Stackhouse*, an English botanist.)

1. **Stackhousia monogyna** (Lab. Nov. Holl. 77. t. 104); erecta, gracilis, ramis elongatis, foliis linearibus lineari-lanceolatis spathulatisve acutis, spicis densifloris apice (alabastro) attenuatis, floribus albis, bracteis calycem æquantibus brevioribusve, carpellis (sicco) rugosis.—*Hook. Journ. Bot.* i. 258. S. obtusa, *Lindl. Bot. Reg. sub* 1917. (*Gunn*, 69, 462.)

Hab. Abundant throughout the Island in a light soil, *Labillardière, etc.*—(Fl. Oct. Nov.) (*v. v.*)

Distrib. East Coast of Australia, from the Tropics to Bass' Straits.

Much the tallest Tasmanian species, 6 inches to 2½ feet high, often much branched from the very base.—*Roots* fibrous or creeping. *Branches* erect, slender, sometimes divided. *Leaves* 1–3 inches long, linear or lanceolate or linear-spathulate, very variable in breadth, acute or acuminate, fleshy, one-nerved or nerveless. *Spikes* 1–6 inches long, 1 inch in diameter, much narrowed at the apex before the flowers are fully expanded. *Flowers* spreading, sweet-scented, white or cream-colour, ⅓–½ inch long, variable in breadth; *bracts* generally longer than the calyx. *Immature cocci* (in dried specimens) have the surface wrinkled.

2. **Stackhousia Gunnii** (Hook. fil.); humilis, robusta, radice repente, caulibus plerumque solitariis, foliis carnosis linearibus lanceolatis lineari-spathulatisve enerviis, floribus flavidis, spicis apice obtusis conicisve. (*Gunn*, 1048.)

Hab. Open sandy pasture-lands, Formosa, Epping Forest, Norfolk Plains, etc., *Gunn.*—(Fl. Nov.)

Distrib. South-eastern Australia.

I have retained this species in deference to Mr. Gunn's opinion, who has repeatedly studied it, and assures me that though so similar to *S. monogyna*, it is always truly distinct. The differences he indicates are, the smaller size, more robust habit, more creeping root, generally solitary stem, blunter spike, and deeper cream-coloured or yellowish flowers. He adds that it is also a perennial. None of the above characters are at all satisfactory to me, and much diminished in value from the plant affecting only certain soils, that tend to produce creeping roots and short stems and fleshy habit. The roots of *S. monogyna* appear to me to be perennial, and Gunn remarks that they creep sometimes; the flowers too of that plant vary much in shade of white and cream-colour. Mr. Adamson, who sends *S. Gunnii* from Melbourne, says that the flowers have a disagreeable odour.

3. **Stackhousia maculata** (Sieb. Pl. Exsicc. 246); caulibus ramosis, ramis robustis ascendentibus, foliis (plurimis) obovato-spathulatis obtusis acutisve coriaceo-carnosis enerviis, spicis brevibus, floribus confertis flavidis aurantiaco-maculatis, coccis lateraliter compressis rugosis dorso producto carinatis.—*Hook. fil. in Journ. Bot.* ii. 421. S. cuneata, *A. C. MSS. in Hb. Hook.* Tripterococcus spathulatus, *F. Müller, MSS.* (*Gunn*, 895.)

Hab. Sand-hills by the sea, Barren Islands in Bass' Straits, *Gunn.*—(Fl. Oct.)

Distrib. Sea-coast, from Moreton Island (*Macgillivray*) to Wilson's Promontory, *Müller.*

This is a remarkably fine species, and well distinguished by the habit, foliage, flowers, and curious fruit: the latter however I have only seen in Australian specimens, and in these it never varies, whereas in different individuals from various parts of that continent (Port Stephens, Moreton Island, Port Jackson, and South Australia) the leaves differ in breadth, the spikes in length and breadth, the flowers in size and colour, and the calyx-lobes in breadth and size.—A diffuse species, branching from the base and sparingly upwards. *Root* perennial. *Stems* ascending, stout. *Leaves* rather fleshy, more or less spathulate, generally broadly so, acute, apiculate, or blunt, ⅔–1½ inch long. *Spikes* short and broad, 1½–2 inches long, 1 broad. *Flowers* cream-coloured, with orange and red spots,

densely packed. *Cocci* three, compressed, laterally wrinkled and pitted, obliquely obovate, the compressed dorsum being produced upwards and backwards.—Sieber's specimen is a very bad one, and I cannot be positive of the identification.

4. **Stackhousia flava** (Hook. fil. Journ. Bot. ii. 421); humilis, gracilis, caule basi ramoso, ramis ascendentibus tenuibus, foliis anguste linearibus carnosulis acutis, spicis brevibus densifloris obtusis, floribus parvis flavidis, calycis lobis late ovatis, carpellis stigmatibusque 2–3.—*Hook. Ic. Pl.* 269. (*Gunn*, 793.)

Hab. Woolnorth, in poor sandy soil, *Gunn.*—(Fl. Nov.)

A remarkably distinct little species, much smaller, more slender, and smaller-flowered than any of its Tasmanian congeners.—*Root* perennial, sending up many simple stems, or one branching much from the base. *Branches* slender, ascending, 6–8 inches high. *Leaves* very narrow, linear, $\frac{3}{4}$ inch long, often subsecund, acute, dried ones with a narrow thickened margin. *Spikes* oblong, cylindrical, blunt, many and dense-flowered, 1–1$\frac{1}{2}$ inch long. *Flowers* shortly pedicelled, small, $\frac{1}{4}$–$\frac{1}{3}$ inch long. *Bracts* very minute, three to five, at the base of the pedicel. *Calyx-lobes* blunt, short. *Petals* rather sharp at the tips. *Ovary* two- or three-lobed.

Nat. Ord. XXVI. LEGUMINOSÆ.

This is perhaps the largest Natural Order of plants in Australia, and the species comprising it are almost unexceptionally confined to that continent, and to very narrow ranges in it; thus the South-eastern Australian *Leguminosæ* are different (often generically) from the South-western ones; and the tropical (amongst which are several widely-spread Asiatic species) differ from both. The maximum of the Order is found in the South-western districts, where also the most peculiar genera occur. About 900 species are known, of which upwards of 420 inhabit the South-western districts only, and about 200 the tropical coasts, including 50, which are common to other countries besides Australia. Of this 900 upwards of 370 belong to the *Podalyrieæ;* 270 to *Mimoseæ;* whilst *Genisteæ* number between 80 and 90; *Galegeæ* and *Phaseoleæ* each between 40 and 50; *Cæsalpinieæ* (the most tropical tribe) 30 to 40; and the remainder, *Trifolieæ, Hedysareæ, Dalbergieæ,* and *Sophoreæ,* very few each.

The Tasmanian species amount to 64, and the *Podalyrieæ, Mimoseæ,* and *Genisteæ* stand in the same order, as regards number of contained species, as they do in all Australia. Only 14 species are confined to Tasmania, as far as is at present known, and of these some will no doubt be found in South-eastern Australia. I am greatly indebted to Mr. Bentham for assistance in determining the Tasmanian species, and in limiting them I have always followed his opinion. The drawing up satisfactory descriptions was often a very difficult task, for, as Mr. Gunn observes in his notes, some of their characters are extremely variable; thus he says that "in the genera *Oxylobium, Aotus, Pultenæa, Daviesia, Hovea, Goodia,* and some others, the pubescence ceases to be an available character whereby to discriminate species, and the leaves are in many instances notoriously subject to variation."

Gen. I. OXYLOBIUM, *Andr.*

Calyx 2-labiatus, 5-fidus, labio superiore 2-fido, inferiore 3-partito. *Vexillum* breve petiolatum, alas oblongas superans. *Carina* oblonga, obtusa, alas æquans. *Stamina* 10, libera, filamentis glabris. *Ovarium* 4-multi-ovulatum. *Legumen* sessile, ovatum, acutum, turgidum, 1-loculare.—Frutices *v.* fruticuli; foliis *sparsis verticillatisve, simplicibus, integris;* floribus *racemosis, luteis v. croceis;* ovario *villoso.*

A large genus of shrubs, confined to Australia, and almost without exception to the extratropical parts. About

twenty-eight species are known, of which the majority are natives of South-west Australia, and none are common to that country and to New South Wales. Several are described as being active poisons to cattle.—*Leaves* whorled or alternate, simple, entire, silky beneath, without stipules. *Flowers* racemose, yellow. *Calyx* two-lipped; upper lip two-, lower three-lobed. *Corolla* with an orbicular standard, which is longer than the oblong wings and keel. *Stamens* ten, free, glabrous. *Ovary* villous, with four or more ovules. *Pod* sessile, ovate, one-celled, with two or more seeds. (Name from *οξυς, sharp*, and *λοβος, a pod;* in allusion to the sharp-pointed pods.)

1. **Oxylobium arborescens** (Br. in Hort. Kew. ed. 2. iii. 9); ramis ramulisque incano-tomentosis, foliis subternis verticillatisve anguste linearibus lineari-oblongisve acutis mucronatisve coriaceis marginibus recurvis superne glabris reticulatis subtus dense albo- v. fusco-tomentosis, costa valida, racemis densifloris subcapitatis axillaribus, pedunculis calycibusque sericeo-villosis, legumine ovato subrostrato acuminato dense villoso, ovulis 6–10, seminibus 3–6 reniformibus atris.—*Ker. Bot. Reg. t.* 392; *Lodd. Bot. Cab. t.* 163; ***Sims, Bot. Mag. t.* 2442; *DC. Prodr.* ii. 104.** (***Gunn*, 464.**)

Hab. On dry sandy soil in the northern parts of the Island, Hampshire Hills, Emu Bay, and Yorktown, *Gunn.*—(Fl. Nov. Dec.)

Distrib. New South Wales, *Frazer, M'Arthur.* **(Cultivated in England.)**

A low or tall shrub, sometimes 6–10 feet high, much branched, and handsome.—*Branches* often whorled, densely covered with appressed white tomentum. *Leaves* whorled in threes or more, or opposite, petioled (petiole glabrous, short), narrow linear or linear-oblong, coriaceous, acute or pungent, margins recurved; upper surface shining, reticulated; under densely downy with fulvous-white, opaque or silvery, appressed tomentum. 1–3 inches long, $\frac{1}{6}$–$\frac{1}{3}$ inch broad. *Flowers* in dense-flowered axillary racemes which are much shorter than the leaves. *Peduncles* and *pedicels* short, covered (as is the calyx) with long silky villous hairs. *Legumes* about $\frac{1}{3}$ inch long, ovate-attenuated, almost rostrate at the top. *Valves* very convex, shaggy with soft hairs.

2. **Oxylobium ellipticum** (Brown, l. c.); foliis lineari- v. elliptico-oblongis obtusis mucronatis, racemis capitatis terminalibus.—Gompholobium ellipticum, *Lab. Nov. Holl.* i. 166. *t.* 135. Callistachys elliptica, *Vent. Malm. t.* 115; *DC. Prodr.* ii. 104. (*Gunn*, 234, 1050.)

Hab. Abundant in heathy places in the southern parts of the Island, and in the mountains ascending to 4000 feet.—(Fl. Oct. Nov.) (Cultivated in England.) (*v. v.*)

This plant very much resembles the last in most characters, but is generally smaller, has much broader, smaller, often elliptical or oblong, mucronate leaves, and terminal capitate flowers. It varies extremely in height, from six inches to seven feet, in the colour and amount of the pubescence on the branches, peduncles, pedicels, calyx, and under surface of the leaves, varying from silvery-white to yellow-brown. The inflorescence is almost capitate, and densely villous; the capsules as in *O. arborescens*, but smaller. The *leaves* vary from $\frac{1}{4}$–1 inch long, and from $\frac{1}{4}$–$\frac{1}{4}$ broad.

Gen. II. GOMPHOLOBIUM, *Sm.*

Calyx subæqualis, 5-fidus. *Vexillum* amplum, alas oblongas superans. *Carina* oblonga, obtusa, alas æquans. *Stamina* 10, libera, filamentis glabris. *Ovarium* breve stipitatum, multi-ovulatum. *Legumen* inflatum, subsphæricum.—Frutices *v.* herbæ; foliis *alternis palmatim* 3–5-*foliolatis impari-pinnatisve;* pedunculis 1-*floris, axillaribus v. ad apices ramulorum racemosis;* floribus *flavis.*

A large Australian genus of about twenty-five species, found both on the east and west extratropical coasts of Australia, but none are common to both: a very few are tropical. The only Tasmanian species belongs to the trifoliolate section, and is a very pretty and common plant throughout the Colony.—Herbs or shrubs, with alternate impari-pinnate or trifoliolate leaves, and axillary one-flowered peduncles, with large yellow flowers. *Calyx* nearly equal, quinquefid. *Standard* broad, longer than the oblong wings. *Keel* oblong, blunt. *Stamens* ten, free.

with glabrous filaments. *Ovary* shortly stipitate, many-ovuled. *Pod* inflated, almost spherical. (Name from *γομφος, a wedge,* and *λοβος, a pod.*)

1. **Gompholobium latifolium** (Smith, in Ann. of Bot. i. 505 et ii. 519) ; decumbens, ramis ascendentibus, foliis sessilibus v. breve petiolatis 3-foliolatis, foliolis lineari-oblongis obovatis v. anguste linearibus, pedunculis gracilibus folio longioribus, carina fimbriata.—*Smith, Linn. Soc. Trans.* ix. 249 ; *Lab. Nov. Holl.* i. 105. *t.* 133 ; *DC. Prodr.* ii. 105. G. fimbriatum, *Sm. Exot. Bot. t.* 58. G. psoraleæfolium, *Salisb. Par. Lond. t.* 6. G. Hügelii, *Endl. En. Pl. Hügel.* (*Gunn,* 24, 475.)

Var. *α* ; foliolis lineari-obovatis oblongisve.

Var. *β* ; foliolis anguste linearibus.

Hab. Abundant in heathy places throughout the Colony, *Labillardière, etc.* — (Fl. Nov. Dec.) (*v. v.*)

Distrib. New South Wales and South Australia. (Cultivated in England.)

Very variable in size and habit.—*Roots* woody, descending, giving off many slender decumbent branches, with slender, ascending, glabrous or pubescent or pilose, flaccid or rigid branches, 4–8 inches long. *Petioles* 1–2 lines long ; *leaflets* three, $\frac{1}{2}$–$\frac{2}{3}$ inch long, variable in form, from narrow linear to linear-obovate, glabrous, deep green above, paler below, uniform in size throughout the individual specimens. *Peduncles* slender, axillary, one-flowered, twice as long as the leaves or more, gradually thickened upwards from above the middle to the calyx. *Flowers* very variable in size, from $\frac{1}{3}$ to 1 inch across, pale or deep yellow. *Calyx-lobes* blunt, margined with down. *Pods* broadly oblong, ventricose, two or three times as long as the calyx.—Gunn considers that there may be two species included under this, but neither Mr. Bentham nor I have been able to discriminate them ; the paler colour of the flowers of one is the only character Gunn alludes to.

Obs. *Gompholobium tomentosum* (Lab. Nov. Holl. i. 106. t. 134) is erroneously described as a native of Tasmania in De Candolle's Prodromus.

Gen. III. DAVIESIA, *Smith.*

Calyx campanulatus, angulatus, æqualis v. subbilabiatus. *Vexillum* longe unguiculatum. *Carina* alas subæquans, incurva. *Stamina* 10, libera ; filamentis dilatatis. *Ovarium* breviter stipitatum, 2-ovulatum. *Legumen* plano-compressum, obliquum, sutura altera recta, altera valde incurva. *Semina* strophiolata.—Fruticuli *et* frutices *habitu polymorphi ;* ramis *teretibus, angulatis, alatis phyllodineisve ;* foliis *nullis v. oppositis v. verticillatis ;* inflorescentia *varia.*

A genus well marked by the character of the pod, which is short, flattened, and very oblique, with a straight upper edge and much curved lower edge, whence it is often triangular ; this distinguishes it from all the decandrous *Leguminosæ* with free stamens and two ovules. The habit of the genus is very variable, and many Australian species assume the most singular forms, so that it is often impossible to guess the Natural Order to which they belong when without the flower or fruit ; this is especially the case with the South-west Australian ones. Upwards of forty species are known, of which about twenty inhabit the southern and eastern coast of Australia, and a few are tropical. (Named in honour of the *Rev. H. Davies, F.L.S.*, a Welsh botanist.)

1. **Daviesia umbellulata** (Smith, Linn. Soc. Trans. ix. 258) ; ramis angulatis rigidis, foliis parvis lanceolatis ovatisve pungentibus, floribus breve pedicellatis in umbellulam paucifloram dispositis rarius sessilibus.—*DC. Prodr.* ii. 114.

Var. *α* ; glabra, ramis spinescentibus, foliis ovato-lanceolatis. (*Gunn,* 799, 1056.)

Var. *β* ; ramis laxioribus vix spinescentibus, foliis longioribus lineari-lanceolatis.—Var. *β.* acuminata, *DC. Prodr. l. c.* D. umbellata, var., *Lab., Nov. Holl.* i. 107. *t.* 137. (*Gunn,* 136, 177.)

Var. γ; ramis spinescentibus foliisque interdum pilosis. (*Gunn*, 181, 1057.)
Hab. Most abundant throughout the Colony.—(Fl. Sept. to Nov.) (*v. v.*)
Distrib. New South Wales and Southern Australia. (Cultivated in England.)

This is one of the most common plants in the Colony, growing in light as well as stiff soil, and forming a harsh rigid spinous bush a few inches to several feet high, sometimes being absolutely prostrate, and at others erect, with a short trunk.—*Branches* grooved, angled, and generally spinescent, glabrous or pilose. *Leaves* ¼–1 inch long, very woody, rigid, sessile, ovate or lanceolate, tapering to a rigid spine, glabrous or pilose. *Flowers* small, blue, in lateral few-flowered umbels or racemes which are shorter than the leaves; *pedicels* with bracteoles at their bases. *Pods* ⅓ inch long, with an arched upper edge and much curved lower, pointed; *valves* smooth and glabrous. *Seed* kidney-shaped, red brown.

2. **Daviesia latifolia** (Br. Hort. Kew. ed. 2. iii. 20); foliis amplis ellipticis oblongis elliptico-lanceolatisve mucronatis reticulatim venosis ramisque inermibus, racemis axillaribus densifloris.—*Sims, Bot. Mag.* 1757; *DC. Prodr.* ii. 113.

Hab. Common throughout the Colony.—(Fl. Oct. Nov.) (*v. v.*)
Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A small evergreen bush 2–5 feet high, with slender angled and sulcate branches.—*Leaves* 1–3 inches long, very variable in shape, from broadly elliptical-oblong or almost orbicular to elliptical-lanceolate, blunt, sharp, acuminate or mucronate; margin with a thickened edge; surfaces alike, and both strongly reticulated. *Racemes* erect, axillary, many-flowered, usually solitary and simple. *Flowers* very numerous, crowded, covered in bud with sheathing coriaceous concave oblong blunt scales ⅙ inch long. *Calyx* with short blunt lobes. *Corolla* yellow and blue, ¼ inch long. *Pods* nearly ½ inch long, very gibbous on the lower edge; *valves* smooth.

Gen. IV. AOTUS, *Smith.*

Calyx ebracteolatus, campanulatus, bilabiatus, labio superiore 2-fido, inferiore 3-fido. *Vexillum* alas oblongas superans, unguiculatum, orbiculatum. *Carina* incurva, obtusa, alas subæquans. *Stamina* 10, libera; filamentis glabris. *Ovarium* subsessile, 2-ovulatum. *Legumen* coriaceum, ovoideum. *Semina* estrophiolata.—Frutices; foliis *sparsis v. ternatim verticillatis, exstipulatis;* pedicellis *axillaribus ebracteatis* 1-*floris;* floribus *flavis.*

An Australian genus of about ten known species, which with very few exceptions are confined to South-west Australia.—Shrubs or under-shrubs, with alternate or whorled exstipulate leaves, and small solitary axillary yellow flowers. *Pedicels* and *flowers* without bracts. *Calyx* campanulate, two-lipped; upper lip bifid; lower trifid. *Standard* broad-clawed, longer than the oblong wings. *Keel* incurved, blunt. *Stamens* ten, free. *Ovary* two-ovuled. *Pod* ovoid, two-seeded. (Named from α, *without*, and ους, *an ear;* in allusion to the calyx not having bracts at its base.)

1. **Aotus villosa** (Curtis, Bot. Mag. t. 949); ramis foliis subtus calycibusque tomentosis, foliis sparsis oblongis linearibusve obtusis acutis mucronatisve marginibus revolutis superne glabris scabrisve, subtus costa valida pilosa.—*Smith, in Simms, Ann. Bot.* i. 504; *Linn. Soc. Trans.* ix. 249; *Brown, Hort. Kew. ed.* 2. iii. 14; *DC. Prodr.* ii. 108. A. ferruginea, *Lab. Nov. Holl.* i. 104. *t.* 132. Pultenæa ericoides, *Vent. Malm. t.* 35. P. villosa, *Andr. Bot. Rep. t.* 309. (*Gunn*, 212, 361, 473.)

Variat insigniter ramis canis pubescentibus tomentosis villosis v. tomentosis et pilosis;—*foliorum* forma magnitudine et dispositione, apicibus obtusis acutis mucronatisve, pagina superiore polita, opaca, pilosa v. scaberula, inferiore glabrata, cana, pubescente v. tomentosa;—*indumento* calycis et magnitudine florum.

Hab. Most abundant throughout the Colony, and often covering many acres of ground.—(Fl. Oct. Dec.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia, King George's Sound? (Cultivated in England.)

This is one of the commonest and most Protean plants in Tasmania, forming a bush 2–6 feet high, covered in spring with yellow blossoms; it varies extremely in size, habit, and the characters of its foliage and flowers, especially in pubescence, being sometimes covered with soft woolly down or villous hairs, at others hoary, or almost glabrous. *Leaves* scattered or whorled, $\frac{1}{4}$–1 inch long, coriaceous, linear or oblong, blunt, sharp or mucronated; margin revolute, entire; upper surface glabrous, smooth and polished, or scabrid or pilose; under green, and almost glabrous, or hoary or tomentose or villous; *midrib* prominent, silky or hairy; *petiole* very short. *Flowers* axillary, solitary or two or three together. *Pedicels* short, stout, and as well as the calyx densely villous. *Corolla* about $\frac{1}{3}$ inch across. *Pods* villous, broadly ovoid, compressed. *Seeds* kidney-shaped, with a black opaque testa.—There are two specimens of this plant in the Hookerian Herbarium marked as coming from King George's Sound, but as there is scarcely a Leguminous plant common to the east and west parts of extratropical Australia, I much doubt the accuracy of the habitat assigned.

Gen. V. SPHÆROLOBIUM, *Smith.*

Calyx 2-labiatus, labio superiore majore 2-fido, inferiore 3-partito. *Vexillum* latum, alas oblongas vix superans. *Carina* alas subæquans, recta v. incurva. *Stamina* 10, libera. *Ovarium* stipitatum, 2-ovulatum. *Legumen* oblique stipitatum, subglobosum. *Semina* estrophiolata.—Fruticuli; ramis *virgatis, sæpius aphyllis;* foliis *dum adsunt exstipulatis;* pedunculis *terminalibus axillaribusve, pauciforis;* bracteis *minutissimis;* corollis *luteis.*

An Australian genus of ten or twelve species; all but the Tasmanian one confined to South-west Australia.—Generally leafless rush-like undershrubs, with slender terete often leafless stems, and axillary or terminal peduncles, bearing a few yellow flowers. *Peduncles* with minute bracteæ; *bracteolæ* none or excessively minute. *Calyx* two-lipped; upper lip broad, bifid, with diverging lobes; lower three-parted. *Corolla* yellow. *Standard* broad-clawed. *Wings* oblong. *Keel* oblong, straight or curved. *Stamens* ten, free. *Ovary* stalked, two-ovuled. *Pod* small, globose, obliquely stalked. (Named from σφαιρα, *a sphere*, and λοβος, *a pod;* in allusion to the form of the pods.)

1. **Sphærolobium vimineum** (Smith, Ann. Bot. i. 509); junceum, ramis ascendentibus parce ramosis, foliis setaceis, pedunculis 1–2-floris infra florem articulatis, calycis lobis subacutis, leguminibus parvis monospermis, seminibus testa maculata.—*Smith in Linn. Soc. Trans.* ix. 261; *Sims, Bot. Mag. t.* 969; *DC. Prodr.* ii. 108. S. minus, *Lab. Nov. Holl.* i. 108. *t.* 138. (*Gunn,* 172.)

Hab. Abundant, usually in marshy and grassy places, in many parts of the Colony.—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia and New South Wales. (Cultivated in England.)

A pretty rush-like little plant, a foot or so high, with slender terete striate branches, generally leafless, but in a young state furnished with a few minute thread-like or subulate leaves.—*Flowers* forming spikes or racemes towards the ends of the branches; peduncles one- or two-flowered, with minute bracts at the base, jointed beneath the flower. *Flowers* drooping. *Calyx-lobes* sharp. *Corolla* bright yellow, about $\frac{1}{4}$ inch across. *Pod* broader than long, inflated, nearly globose, on a slender pedicel that is as long as the tube of the calyx; *valves* coriaceous. *Seed* solitary, broadly-oblong or ovoid, with a mottled testa.

Obs. The allied *Viminaria denudata*, which is common in South-eastern Australia, and is also a leafless plant like *Sphærolobium vimineum*, has been stated by De Candolle (ii. 107) to have been collected in Tasmania; but Mr. Gunn has never found it, and suspects some mistake; it may be recognized by its general similarity to *Sphærolobium*, but distinguished from it by the pod being indehiscent.

Gen. VI. DILLWYNIA, *Smith.*

Calyx campanulatus, breviter 2-labiatus, labio superiore bifido, inferiore 3-partito. *Vexillum* latis-

simum, unguiculatum, duplo longius quam latum, bifidum, alas oblongas angustas superans. *Carina* alis brevior, recta, obtusa. *Stamina* 10, libera. *Ovarium* subsessile, 2-ovulatum. *Legumen* ovatum, ventricosum. *Semina* strophiolata.—Frutices; foliis *alternis, simplicibus, exstipulatis;* inflorescentia *corymbosa v. capitata, terminali v. axillari;* pedicellis *brevibus, 2-bracteolatis.*

Chiefly distinguished from *Pultenæa* by the broader vexillum, bracteolæ on the pedicels, and absence of stipules. A genus of about ten Australian species, almost wholly confined to the South-eastern extratropical parts, only one or two being West Australian.—*Shrubs* with alternate, simple, exstipulate, entire, generally subulate leaves, with revolute margins. *Inflorescence* in axillary or terminal capitate corymbs. *Pedicels* bibracteolate. *Calyx* two-lipped; upper lip bifid; lower three-parted. *Standard* broader than long, two-lobed or notched. *Wings* narrow-oblong. *Keel* straight, blunt, shorter than the wings. *Stamens* ten, free. *Ovary* two-ovuled, sessile. *Pod* ovate, ventricose. (Named in honour of *L. W. Dillwyn, Esq.*, an eminent British botanist.)

1. **Dillwynia glaberrima** (Smith, in Linn. Soc. Trans. ix. 263); gracilis, erecta, virgata, ramis ramulisque gracilibus glabris pubescentibusve, foliis anguste lineari-setaceis filiformibusve rectis curvisve obtusis v. acutis teretibus antice sulcatis, floribus terminalibus subcapitato-corymbosis.—*Sims, Bot. Mag. t.* 944; *Lodd. Bot. Cab. t.* 582; *Lab. Nov. Holl.* i. 109. *t.* 139; *DC. Prodr.* ii. 108. (*Gunn,* 469.)

Hab. Common in poor wet sandy soil, especially in the northern parts of the Island.—(Fl. Nov.)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A graceful shrub, a few inches to 3 or 4 feet high, sometimes drawn up to 7 feet (Gunn). *Branches* slender, glabrous or pubescent. *Leaves* numerous, filiform, $\frac{1}{3}$–1 inch long, smooth and glabrous, straight or recurved, with a blunt or hooked recurved tip, inserted on small tubercles of the stem by very minute petioles; upper surface grooved down the front; back rounded. *Flowers* in terminal subcapitate corymbs. *Peduncles* two- to five-flowered; *pedicels* short, with bracteolæ at the base. *Calyx* glabrous or silky, its lobes blunt, villous at the edges. *Standard* $\frac{1}{3}$ inch across. *Pod* about twice as long as the calyx, broadly ovate, pilose or silky. *Valves* coriaceous. *Seed* solitary, pale brown, obliquely ovoid, with a large lobed strophiolus.—The *D. ericæfolia*, Smith, *D. parvifolia*, Br., and *D. ramosissima*, Benth., are probably states of this plant.

2. **Dillwynia floribunda** (Smith, Exot. Bot. i. t. 26); suberecta, robusta, ramis ramulisque robustis pubescentibus sericeisve, foliis acicularibus acutis glabris scaberulisve, junioribus sericeo-villosis, floribus lateralibus solitariis binisve.—*DC. Prodr.* i. 108. D. ericæfolia, *Sims, Bot. Mag. t.* 1545, *sub* 2247, *non Smith.* D. sericea, *A. Cunn. in Herb.* D. adenophora, *Endl. En. Plant. Hügel.* (*Gunn,* 670.)

Hab. Common in dry stony and gravelly places in various parts of the Colony, as near Hobarton and Launceston.—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A shorter, much more robust plant than *D. glaberrima*, and at once distinguished from it by the lateral inflorescence. *Branches* woody, 2–10 inches long, often much branched, pubescent or tomentose, rarely glabrous, densely villous at their tips. *Leaves* patent, often recurved, rigid, acicular, acute, deeply grooved on the front, terete on the back, scabrid, $\frac{1}{4}$–$\frac{2}{3}$ inch long; upper silky or villous. *Flowers* generally solitary, axillary, shortly pedicelled. *Calyx* silky or hispid, its lobes blunt, rarely glabrous.—The *D. sericea*, A. Cunn., and *D. adenophora*, Endl., are only states of this plant; the latter name is derived from the occasional presence of a very deciduous gland at the apex of the calyx-lobes.

3. **Dillwynia cinerascens** (Brown, in Sims, Bot. Mag. t. 2247); gracilis, ramis decumbentibus ascendentibusve glabris cano-puberulisve, foliis glaberrimis filiformibus rectis curvisve apice subacuto, pedunculis brevibus unifloris in corymbis terminalibus lateralibusve aggregatis, calyce sericeo.—*Lodd. Bot. Cab. t.* 527; *DC. Prodr.* ii. 109. (*Gunn,* 468, 669.)

Hab. Common in grassy and heathy places throughout the Colony.—(Fl. Oct. Nov.) (*v. v.*)
Distrib. South-eastern Australia and New South Wales. (Cultivated in England.)

This, though often prostrate, is sometimes erect, and has then the habit of *D. glaberrima*, from which it differs conspicuously in the single-flowered peduncles, which do not form corymbs, but are aggregated, generally at the tips of the branches, into corymb-like heads. It is much more difficult to distinguish it from *D. floribunda* by general characters, but it is a far more slender, graceful plant, with much more slender, filiform, glabrous leaves, and the flowers are less villous, and comparatively rarely lateral.—*Stems* 6 inches to 2 feet high, sparingly branched, slender, glabrous below, silky towards the tips. *Leaves* as variable in size as those of *D. glaberrima*, and quite like them. *Peduncle* and *calyx* villous or silky; lobes of the latter blunt.

Gen. VII. PULTENÆA, *Smith.*

Calyx campanulatus, basi bibracteolatus, semiquinquefidus, subæqualis v. subbilabiatus. *Vexillum* rotundatum, alas oblongas superans. *Carina* recta, obovata v. oblonga. *Stamina* 10, libera; filamentis nudis. *Ovarium* sessile, 2-ovulatum. *Stylus* deciduus. *Legumen* ovatum, compressum, v. subturgidum. *Semina* strophiolata.—Frutices; foliis *alternis, simplicibus, integerrimis v. apice bilobis;* stipulis *scariosis, varius* 0; inflorescentia *terminali v. axillari;* floribus *solitariis capitatisve;* bracteis *scariosis v.* 0.

One of the largest genera of Australian *Leguminosæ*, and found in no other part of the globe; about seventy species have been discovered, chiefly on the extratropical eastern side of Australia, only one tropical species being known.—*Shrubs*, often small and Heath-like, never arborescent. *Leaves* alternate, entire or lobed at the apex, simple, with scarious stipules or none. *Inflorescence* in short capitate corymbs or heads, or solitary. *Calyx* with two small bracts at the base, campanulate, equal or two-lipped, five-lobed. *Standard* orbicular. *Wings* oblong. *Keel* straight. *Stamens* ten; filaments free, glabrous. *Ovary* sessile, with two ovules. *Pod* compressed or turgid, short. *Seeds* without a strophiolus.—The sections of this genus are those proposed by Bentham, and are provisional only. (Named in honour of *Dr. W. Pulteney*, a botanical author.)

§ 1. Capitatæ.—*Flower-buds forming terminal heads, rarely solitary, surrounded with scarious bracts. Stipules minute or none.*

1. **Pultenæa daphnoides** (Smith, in Ann. Bot. i. 502); erecta, virgata, 5-pedalis, ramulis angulatis sericeis, stipulis parvis ovatis, foliis obovato-cuneiformibus costa percurrente mucronatis utrinque glaberrimis, floribus dense capitatis, pedicellis basi bracteis scariosis suffultis, calyce sericeo-villoso.—*Andr. Bot. Rep. t.* 98; *Sims, Bot. Mag. t.* 1394; *Br. Hort. Kew. ed.* 2. iii. 18; *DC. Prodr.* ii. 110. (*Gunn,* 185.)

Var. *β. obcordata;* foliis brevioribus.—P. obcordata, *Andr. B. Rep. t.* 574; *Br. Hort. Kew. ed.* 2. iii. 18.

Hab. Var. *β. obcordata,* not uncommon in various parts of the Island.—(Fl. Oct. Nov.) (*v. v.*)
Distrib. Var. *α.* New South Wales and South-eastern Australia. (Cultivated in England.)

An erect shrub 5–6 feet high, the largest of the genus, flowering abundantly, and very handsome. *Branches* erect, slender, striated, angled, silky, as are the petioles. *Leaves* ½–1 inch long, obovate-cuneate, shortly petiolate, with a stout midrib forming a strong excurrent point, deep green above, pale beneath. *Stipules* ovate, small, red-brown, scarious. *Flowers* in terminal heads; buds surrounded with scarious oblong deciduous scales, that are silky at the back. *Pedicels* short, with imbricating broadly-ovate scarious brown bracts at the base. *Calyx* shaggy with silky silvery hairs; *bracteoles* linear, shorter than the calyx-lobes. *Corolla* variable in size and colour. *Standard* bright yellow, about ½ inch across. *Wings* usually deep purple.—I have united *P. obcordata* with the *P. daphnoides*, Sm., of which it is undoubtedly only a southern form, with generally rather shorter leaves. Gunn remarks that it is tender in Tasmania, and that the young shoots of plants in his garden are annually frostbitten.

2. **Pultenæa stricta** (Sims, Bot. Mag. t. 1588); erecta v. decumbens, virgata, 1–2-pedalis, ramulis

sericeo-pubescentibus, foliis obovato- v. lineari-oblongis rarius subcuneatis costa percurrente mucronatis utrinque glaberrimis, floribus 3–5 capitatis, pedicellis basi bracteis scariosis suffultis, calyce sericeo-villoso. —*Lodd. Bot. Cab. t.* 974; *DC. Prodr.* ii. 111. (*Gunn*, 471.)

Hab. Abundant in various localities; often in moist peaty soil.—(Fl. Nov. Dec.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

A much smaller species than *P. obcordata*, seldom more than 2 feet high. — *Stems* erect or decumbent; branches pubescent or silky, slender, twiggy. *Leaves* small, ¼ inch long, variable in shape, obovate or oblong or almost cuneate-obovate, never so cuneate as in *P. obcordata*, mucronate at the blunt or acute tip; *petioles* very short; *stipules* minute. *Flowers* in terminal few-flowered heads, which are surrounded when young with scarious concave brown bracts. *Pedicels* very short; *flowers* like those of *P. obcordata*, but smaller. *Pods* compressed, mucronate, twice as long as the calyx, with a slightly curved upper margin and very convex lower one; valves and margins silky. *Seeds* one or two, obliquely ovoid, blunt.

3. **Pultenæa subumbellata** (Hook. Bot. Mag. 3254); erecta (rarius decumbens), ramulis gracilibus virgatis sericeis, foliis sparsis imbricatisve linearibus lineari-oblongisve acutis obtusisve non mucronatis coriaceis planis v. marginibus incurvis utrinque glaberrimis, capitulis terminalibus densifloris, bracteis paucis parvis orbiculatis deciduis, bracteolis a calyce distinctis, legumine globoso villoso, valvis crassis.—*Lindl. Bot. Reg. t.* 1632.

Var. *α*; foliis lineari-oblongis subacutis planis aveniis v. uninerviis inferne (sicco) fuscis superne pallidis.—*Bot. Mag. l. c.* (*Gunn*, 137, 186, 216.)

Var. *β. alpina*; parvula, caule procumbente, ramis brevibus ascendentibus, foliis parvis subimbricatis. (*Gunn*, 319.)

Hab. Abundant in moist situations, generally on banks of rivers inundated in winter. Var. *β.* On the Western and other mountains, ascending to 4000 feet; common.—(Fl. Sept. Nov.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

An extremely abundant and pretty little plant, forming miniature thickets, 1–3 feet high, along the margins of streams, covered with a profusion of bright golden-yellow blossoms.—*Stems* terete, erect, procumbent in var. *β.* slender, twiggy, silky towards the tips. *Leaves* without stipules, numerous, scattered or imbricating, suberect or rarely recurved, shortly petioled, linear-oblong or oblong, rarely somewhat obovate, acute or blunt, never mucronate, quite glabrous, flat or margins a little incurved, not keeled below, ⅓–½ inch long, ¼ inch in var. *β*; the upper with dilated petioles, which become converted into the bracts. *Capitula* terminal, of six to ten sessile flowers. *Pedicels* very short indeed, surrounded by a few pale, small, orbicular, tomentose and ciliated bracts. *Calyx* villous, rarely glabrous. *Flowers* extremely variable in size and depth of colour, the largest ½ inch long. *Pods* small, ⅛ inch long, globose, villous; valves hard and woody.—This is one of the very variable plants of the Island, and I doubt whether the following is distinct from it, although it looks quite so.

4. **Pultenæa selaginoides** (Hook. fil.); glaberrima, erecta, virgata, foliis parvis subimbricatis obovato-lanceolatis acutis crasse coriaceis concavis marginibus incurvis dorso carinatis, capitulis terminalibus densifloris, bracteis oblongis parvis calycibusque glaberrimis. (*Gunn*, 1954.)

Hab. Eastern parts of the Island, St. Paul's River, Avoca, *Gunn*.

This is a peculiar-looking plant, and very different in aspect from any state of *P. subumbellata* with which I am acquainted, and yet I cannot but fear that (as Mr. Gunn suggests) it may be a variety of that. It forms a small, slender shrub, everywhere perfectly glabrous. Old branches with white bark, scarred with the prominent insertions of the fallen leaves.—*Leaves* numerous, uniform in size, erect, imbricating, very thick and coriaceous, obovate-lanceolate, acute, very concave, keeled at the back. *Flowers* as in *P. subumbellata*, but smaller, with small, oblong, more coriaceous bracts, and a coriaceous, perfectly glabrous calyx.

5. **Pultenæa pimelioides** (Hook. fil.); erecta, virgata, ramulis sericeis glabrisve, foliis stipulatis coriaceis lineari-lanceolatis oblongo-linearibusve acutis marginibus incurvis dorso subcarinatis, capitulis terminalibus densifloris plurimis bracteis basi brunneis scariosis imbricatis, bracteolis tubo calycis insertis lanceolatis integris bifidisve. (*Gunn*, 467.)

Hab. Northern parts of the Island, Rocky Cape and Woolnorth, in wet sandy soil, *Gunn.*—(Fl. Oct.)

An erect shrub, 1–2 feet high, more robust in habit (according to the specimens from two localities only) than either of the two preceding.—*Branches* fascicled, slender, twiggy, silky towards the tips. *Stipules* small, ovate, acute. *Leaves* generally spreading or recurved, $\frac{1}{2}$ inch long, linear or linear-oblong or linear-lanceolate, acute or acuminate; upper surface pale, concave, with incurved margins; lower dark brown, obscurely keeled. *Flowers* in very dense heads, surrounded at the base with many small, imbricating, coriaceous, dark brown bracts. *Calyx* very silky. *Flowers* deep ochreous-yellow, but probably variable in colour, small; standard $\frac{1}{3}$ inch long.

This species is best distinguished from *P. subumbellata* by the longer, narrower, more acute leaves, with more incurved margins, the more persistent and prominent stipules, and by the numerous, hard, persistent, scarious, imbricating bracts, which form a cone in the bud. It is very nearly related to *P. dentata*, Lab., in the inflorescence, but in the absence of fruit its nearest affinity cannot be decided.

6. **Pultenæa Gunnii** (Benth. Ann. Mus. Vind. ii. 82); erecta v. decumbens, ramulis hispidis pubescentibus cinereisve demum glabratis, stipulis parvis, foliis parvis ovatis ovato-oblongis ovato-lanceolatisve marginibus recurvis supra glabris subtus pubescente-pilosis glabratisve, capitulis terminalibus pauci- v. plurifloris, bracteis brevibus subimbricatis v. subnullis, bracteolis setaceis calyci insertis, legumine oblique ovato acuminato compresso pubescente. (*Gunn*, 133, 668, 1953.)

Variat insigniter :—*habitu* erecto v. decumbente ;—*ramis* erectis patentibusve, brevibus elongatisve, glabratis v. dense pubescente-pilosis ;—*foliis* magnitudine, colore, forma, dispositione (erectis patentibusve), pagina inferiore glabrata v. subsericeo-pubescente ;—*petiolo* brevissimo v. subgracili ;—denique *capitulis* pluri- v. paucifloris dense v. laxifloris, bracteatis v. subebracteatis, floribus subsessilibus v. gracile pedicellatis. (Tab. XIII.)

Var. *α. erecta ;* major, foliis $\frac{1}{4}$–$\frac{1}{3}$-pollicaribus.

Var. *β. prostrata ;* minor, foliis ovatis $\frac{1}{6}$–$\frac{1}{8}$-pollicaribus.

Hab. Abundant throughout the Colony in moist soil, *Lawrence, Gunn, etc.* Var. *β.* On the mountains ascending to 2–3000 feet.—(Fl. Oct. Nov.) (*v. v.*)

An exceedingly common and variable plant, much resembling at first sight *P. subumbellata*, but readily distinguished from it and its immediate allies by the recurved margins of the leaves, which are generally pubescent beneath, as also by the very different pods.—A small shrub, 1–2 feet high. *Branches* erect or decumbent; upper slender, pubescent-pilose, tomentose or glabrous. *Leaves* numerous, patent or suberect, ovate or ovate-lanceolate or oblong-lanceolate, acute or blunt, convex above, margins recurved, lower surface generally villous or pilose, rarely glabrous, $\frac{1}{4}$–$\frac{1}{3}$ inch long; in var. *β* much smaller, ovate, nearly sessile, blunt, $\frac{1}{8}$–$\frac{1}{6}$ inch long. *Flowers* in terminal heads, few or many, crowded or lax; pedicels very short or slender. *Bracts* minute, imbricated, red-brown, scarious, rarely absent. *Calyx* villous, its lobes sharp; bracteoles placed on the tube. *Corolla* very variable in size and colour, $\frac{1}{4}$–$\frac{1}{2}$ inch long. *Pods* compressed, obliquely ovate-acuminate; valves pubescent.—Plate XIII. Fig. 1, 2, and 3, leaves; 4, flower; 5, standard; 6, ala; 7, keel; 8, stamen; 9, ovary; 10, longitudinal section of ovary; 11, valve of pod, and seed; 12, seed; 13, embryo :—*all magnified.*

7. **Pultenæa dentata** (Lab. Nov. Holl. i. p. 103. t. 131); fruticulus scoparius, caule brevissimo, ramis suberectis gracilibus apice sericeis, foliis acicularibus v. anguste linearibus acutis puberulisve dorso concavis enerviis superne concavis v. marginibus ad costam involutis, capitulis terminalibus densifloris, bracteis plurimis imbricatis exterioribus late ovatis mucronatis intimis lobatis, bracteolis tubo calycis insertis bifidis cuspidatis apice dentatis, leguminibus late ovatis acuminatis compressis, valvis pubescentibus,

seminibus ovoideis orbiculatisve pallidis nitidis.—*DC. Prodr.* ii. 113. P. argentea, *A. Cunn. in Field. N. S. W.* 347. (*Gunn*, 467, 794, 795, 796.)

Hab. Northern parts of the Island: Rocky Cape, Woolnorth, and Hampshire Hills, *Lawrence, Gunn, etc.*—(Fl. Oct.)

Distrib. New South Wales.

This agrees so well in most respects with Labillardière's figure and description that I can hardly doubt its being his plant, though that is described as coming from "terra Van Leeuwyn;" the bracteolæ on the calyx are omitted, and the seeds are described as dark-coloured.—A small, Heath-like species, with a very short stem, and many slender, wiry, erect or ascending branches, 6–18 inches long, silky towards the tips. *Stipules* minute, ovate-subulate. *Leaves* erect or recurved, very narrow and slender, acicular or linear, $\frac{1}{4}$–$\frac{3}{4}$ inch long, glabrous or slightly puberulous, acute or acuminate, concave in front or channelled, the margins involute to the costa, concave at the back. *Flowers* in dense terminal heads, small, closely invested with numerous dark-brown, imbricating, ovate-acute bracts (as in *P. pinaleoides*). *Bracteoles* attached to the tube of the calyx, split or toothed, generally bifid, with cuspidate lobes and a central awn. *Pods* small, compressed, ovate, acuminate.

8. **Pultenæa prostrata** (Benth. MSS.); parvula, prostrata, diffuse ramosa, ramis tenuibus, ramulis ascendentibus sericeis, stipulis subulatis, foliis acicularibus sericeo-villosis glabratisve obtusis teretibus antice medio sulcatis, floribus solitariis terminalibus multibracteatis, bracteis imbricatis sericeis calyce æquilongis obtusis bifidis, bracteolis basi calycis insertis ovato-lanceolatis amplis calyce sericeo æquilongis.—P. polyota, *Müll. MSS.* (*Gunn*, 672, 1950.)

Hab. Plains near Ross, *Gunn.*

Distrib. South-eastern Australia.

A small, prostrate plant, forming depressed patches a foot broad, silvery-grey from the white silky pubescence on the branches, etc.—*Stems* woody, much divided. *Branchlets* slender. *Stipules* small, subulate. *Leaves* alternate or fascicled on short lateral branchlets, $\frac{1}{4}$–$\frac{1}{3}$ inch long, acicular, rather thickened upwards, blunt or acute, almost terete, channelled down the front, convex at the back, more or less pubescent or silky. *Flowers* solitary, terminal, enclosed in many imbricating pale brown, silky, bifid or variously lobed bracts. *Calyx* very silky, with two ovate, scarious bracteoles inserted at its base, and nearly as long as itself. *Flowers* $\frac{1}{3}$ inch long.

§ 2. Proliferæ (Benth.).—*Flowers in terminal bracteate heads; bracts often becoming leafy. Stipules conspicuous, giving a squarrose appearance to the branches.*

9. **Pultenæa Hibbertioides** (Hook. fil.); robusta, humilis, molliter pilosa, caulibus procumbentibus lignosis, ramis ascendentibus suberectisve molliter patentim pilosis, stipulis subrecurvis lanceolato-subulatis squarrosis, foliis plurimis lineari-acerosis acuminatis scaberulis et patentim pilosis glabratisve medio antice canaliculatis dorso convexis, capitulis terminalibus pauciloris multibracteatis, bracteis brunneis scariosis dense imbricatis lanceolatis fissis lacerisve, calycibus membranaceis parce pilosis, bracteolis apice pedicelli insertis lanceolatis calyce æquilongis, legumine oblique elliptico-ovato apice subattenuato acuminato subcompresso villoso, semine ovideo pallido. (*Gunn*, 1054.)

Hab. In large patches, twelve miles from Georgetown, on the road to Launceston, *Gunn.*—(Fl. Nov.)

Distrib. South-eastern Australia.

A short, robust species, with woody, prostrate stems, and many suberect or ascending branches, 12–18 inches long, covered with soft, spreading, white, woolly hairs, and brown, scarious, subulate, recurved stipules, $\frac{1}{2}$ inch long. *Leaves* spreading, curving, acicular, $\frac{1}{3}$ inch long, $\frac{1}{4}$ line broad, generally rough, and also pilose, sometimes quite glabrous, convex at the back, deeply channelled down the front, acute or acuminate. *Heads* terminal, surrounded by the leaves, which overtop them, hard, conical at the base from the number of imbricating, red-brown,

striated, scarious, lanceolate bracts, that are split or lacerated. *Flowers* three to five in a head, sessile, or on slender pedicels, $\frac{1}{3}$ inch long. *Calyx* membranous, sulcate; *lobes* pilose, acute; *bracteoles* lanceolar, attached to the very apex of the pedicel, as long as the calyx. *Pod* half as long again as the calyx, obliquely elliptical-ovate, rather turgid, abruptly narrowed to an acuminate point. *Seed* pale, ovoid, blunt, with a large oblong caruncule.

This plant is named *P. mollis*, Lindl., by Müller in his Victoria collections, but differs from Lindley's plant in the less leafy heads, and especially in the long bracteolæ at the base of the calyx. Müller sends a very curious state, that I have not seen from Tasmania, and which is nearly glabrous, and has much shorter, broader, linear or linear-oblong leaves, with three obscure nerves, and the upper surface covered with short, hispid hairs. It does not in the least resemble any of the Tasmanian or of Dr. Müller's other specimens, and shows how much these variable plants require investigation on the spot, and a proper selection of all states and varieties. The common Tasmanian state resembles a *Hibbertia* in habit and general appearance.

10. **Pultenæa juniperina** (Lab. Nov. Holl. i. p. 103. t. 130); frutex erectus rigidus, ramulis pilosis et pubescente-tomentosis, stipulis subulatis, foliis patulis petiolatis rigidis linearibus lineari-lanceolatisve subtriquetris glabris longe aristato-acuminatis superne concavis dorso costa carinatis, floribus subcapitatis solitariisve terminalibus bracteis parvis imbricatis aristatis, pedicellis tomentosis, bracteolis basi calycis insertis ovato-lanceolatis obtusis pungentibusve ciliatis calyce dimidio brevioribus, leguminibus linearioblongis turgidis calyce duplo longioribus pubescentibus, seminibus oblongis atro-fuscis.—*DC. Prodr.* ii. 113. (*Gunn*, 179, 1951, 1952.)

Hab. Abundant throughout the Island, ascending to 4000 feet, *Labillardière, etc.*—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A common and very variable plant, forming an erect, rigid, woody, prickly shrub, often 6 feet high, covered with pungent leaves and bright, rather pale, yellow flowers. *Branches* generally very tomentose. *Stipules* small, appressed to the branches. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ inch long, rigid, linear-lanceolate or narrow linear-subulate, generally spreading at right angles from the apex of a slender petiole, which is appressed to the stem. *Flowers* terminal, generally two or three together. *Bracts* small, ovate-acuminate, pungent. *Bracteolæ* small, inserted at the base of the calyx, and much shorter than its tube, generally lanceolate-acuminate and pungent, ciliated. *Pedicel* tomentose. *Calyx* with short spreading lobes, two-lipped, pubescent. *Corolla* about $\frac{1}{2}$ inch long. *Pod* ovate-oblong or linear-oblong, acuminate, twice as long as the calyx; valves turgid, pubescent. *Seeds* oblong, almost black.—This differs a little from the section to which it belongs in the flowers being scarcely capitate, and the stipules small. The following is perhaps not specifically distinct from it.

11. **Pultenæa cordata** (Graham in Ed. Phil. Journ. xx. 195); frutex rigidus erectus, ramis robustis, ramulis tomentosis et patentim pilosis dense foliosis, stipulis subulatis appressis, petiolis gracilibus, foliis patentibus rigidis ovato- v. cordato-lanceolatis acuminato-aristatis pungentibus glaberrimis v. dorso basi ciliatis superne concavis dorso costa carinatis, capitulis terminalibus 6–8-floris, bracteis parvis acutis pungentibusve, calyce patentim piloso, bracteolis basi insertis ovato-lanceolatis acutis pungentibusve tubo brevioribus.—*Hook. Bot. Mag. t.* 3443. (*Gunn*, 1052.)

Hab. In stony places, Asbestos Hills, and York Town, *Gunn;* Bagdad, *Miss Forster.*—(Fl. Oct. Nov.)

Distrib. South-eastern Australia. (Cultivated in England.)

This differs very much in general appearance from *P. juniperina*, owing chiefly to the much more crowded, broader, uniformly patent leaves; but it is in other respects so closely allied to that plant, that I doubt its being more than a variety of it.—*Branches* densely tomentose with spreading hairs. *Stipules*, *petioles*, and *flowers* as in *P. juniperina*. *Leaves* $\frac{1}{5}$–$\frac{1}{3}$ inch long, broadest at the base, and there ovate or cordate, gradually tapering to the

pungent point, concave above, or flat with incurved margins, often pilose at the back.—The *P. epacridea*, Muller, seems to be a nearly allied plant, differing conspicuously in the absence of petioles.

§ 3. Laxifloræ (Benth.).—*Flowers solitary, generally axillary and scattered, with few or no bracts.*

12. **Pultenæa diffusa** (Hook. fil.); fruticulus ericoideus, caulibus diffusis procumbentibus, ramulis gracilibus puberulis, stipulis minimis, foliis breve petiolatis patulis v. recurvis brevibus parvis anguste lineari-oblongis acutis glabris superne planiusculis subtus costa crassa flava, floribus axillaribus pedicellatis, pedicello folio breviore basi bractea parva oblonga obtusa concava suffulto, calyce campanulato bilabiato basi bracteolis parvis ovatis acutis subdentatis aucto, vexillo orbiculari. (*Gunn*, 470, 797.) (Tab. XIV.)

Hab. Sandy plains, etc., in various localities, Woolnorth, Hampshire Hills, Hobarton, and Port Arthur, *Milligan, Backhouse, etc.*—(Fl. Nov.) (*v. v.*)

A very anomalous species, intermediate in character between *Dillwynia* and *Pultenæa*, resembling *Dillwynia cinerascens* more than any other Tasmanian plant, but differing from that genus in the bracteolæ being placed on the calyx, in the broad base of the calyx (which is however equally broad in *D. cinerascens*), and in the orbicular standard not being broader than long: it differs from *Pultenæa* in the more obviously two-lipped calyx.—A diffuse, slender, small shrub. *Stems* terete, prostrate or procumbent, with numerous ascending, slender, puberulous branches, covered with grey-green, rather rigid, spreading, recurved foliage. *Stipules* none, or very minute, at the base of the upper leaves. *Petioles* very short. *Leaves* ¼ inch long, narrow, linear-oblong, acute, glabrous or slightly pilose at the back: upper surface rather convex; lower with a broad flat costa, and thick edges formed by the margins of the leaf being recurved and adnate to the limb and costa beneath. *Flowers* scattered, axillary, small, on slender pedicels, shorter than the leaves. *Bract* at the base of the pedicel minute. *Calyx* 2 lines long, two-lipped; lips with short broad teeth. *Bracteoles* short, appressed to the base of the calyx, ovate, toothed, acute. *Keel* shorter than the wings. *Ovary* pubescent. *Style* thickened from the base nearly to the middle.—Plate XIV. Fig. 1, front, and 2, back view of leaf; 3, transverse section of ditto; 4, flower; 5, vexillum; 6, carina; 7, ala; 8, stamen; 9, pollen; 10, ovary; 11, vertical section of ovary:—*all magnified.*

13. **Pultenæa pedunculata** (Hook. Bot. Mag. t. 2859); fruticulus humilis depressus, ramulis gracilibus divaricatis pubescenti-tomentosis, stipulis subulatis, foliis parvis anguste lineari-lanceolatis planis acuminatis pungentibus marginibus subrecurvis scaberulis subtus glabris v. pilosis costa prominula, floribus solitariis, bracteis paucis subulatis, pedicellis foliis longioribus gracilibus appresse pilosis, calycis lobis lanceolato-subulatis, bracteolis basi calycis insertis subulatis.—P. Diemenica, *Turczaninow; Bull. Soc. Imp. Mosc.* 1853, *p.* 277. (*Gunn*, 673.)

Hab. Common in sandy plains near Hobarton, and probably throughout the Island, *Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

A very distinct species, easily recognized by its prostrate, depressed habit, and long, slender pedicels.—A small shrub, forming large flat masses on the ground. *Branches* slender, spreading, pubescent or tomentose. *Stipules* subulate, often aristate and nerved, especially those of the uppermost leaves. *Leaves* shortly petioled, $\frac{1}{6}$–$\frac{1}{4}$ inch long, narrow, linear-lanceolate, acuminate, pungent, flat, with slightly recurved margins, scaberulous on both surfaces. *Pedicels* twice as long as the leaves. *Bracteoles* subulate. *Calyx-lobes* narrow and acuminate. *Flowers* small.

14. **Pultenæa humilis** (Benth. MSS.); fruticulus humilis, caule brevi robusto, ramis erectis validis, ramulis tomentosis, stipulis ovato-lanceolatis, foliis subimbricatis linearibus lineari-oblongis elliptico-oblongisve obtusis in petiolum brevem attenuatis, marginibus incurvis superne glabris dorso sericeo-pilosis, capitulis multifloris foliosis proliferisve villosis, bracteis lanceolatis acuminato-subulatis sulcatis scariosis,

floribus pedicellatis, calycis tubo brevi lobis elongatis lineari-subulatis patentim pilosis, bracteolis basi calycis insertis anguste linearibus pilosis. (*Gunn*, 671.)

Hab. Epping Forest, near Campbell-town, and Snake Banks, twenty-five miles from Launceston, on the road to Hobarton, in sandy soil, *Gunn.*—(Fl. Nov.)

A very distinct species, short and robust for the size of the leaves and flowers.—*Stem* very short, woody. *Branches* 6–10 inches high, stout, erect or ascending, covered with spreading or subimbricated leaves, villous at the tips. *Stipules* conspicuous, lanceolate-subulate, acuminate, red-brown, furrowed. *Leaves* narrowed into very short petioles, $\frac{1}{4}$–$\frac{1}{3}$ inch long, generally elliptic-oblong, sometimes linear, or ovate, blunt, concave, with incurved margins, silky on the convex back. *Flowers* large, deep orange-yellow, almost hidden by the leaves, collected into heads. *Bracts* numerous, like the stipules. *Pedicels* tomentose, short. *Calyx* with a short conical tube, and long, spreading, very narrow lobes, covered with soft, spreading hairs. *Bracteoles* like the calyx-lobes, and as long as the calyx.—This differs considerably from any other Tasmanian species, and is more nearly allied to the Australian *P. elliptica* and *P. villifera*.

15. **Pultenæa tenuifolia** (Br. in Bot. Mag. t. 2086); fruticulus prostratus humilis sericeus diffuse ramosus, ramis brevibus elongatisve velutino-pubescentibus villosisve, stipulis ovato-lanceolatis, foliis fasciculatis sericeo-pilosis lineari-subulatis obtusis supra concavis canaliculatisve subtus convexis, floribus lateralibus v. ad apices ramulorum brevissimorum terminalibus solitariis parvis sessilibus, bracteis parvis lanceolatis, bracteolis basi calycis insertis calyce æquilongis anguste lineari-lanceolatis, leguminibus parvis calycem paulo excedentibus late oblique ovatis acuminatis subturgidis villosis.—*DC. Prodr.* ii. 113; *Benth. Ann. Mus. Vind.* ii. 82. P. candida, *Lodd. Bot. Cab. t.* 1236. (*Gunn*, 1055, 308?)

Hab. On sandy lands near the sea: Circular Head, Woolnorth, and Georgetown, *Gunn.*—(Fl. Sept.)

Distrib. South-eastern Australia. (Cultivated in England.)

A small decumbent or prostrate plant, resembling *P. prostrata* and *P. fasciculata* to a certain degree in foliage, etc.—*Branches* woody, ascending or prostrate; *branchlets* densely villous with white silky hairs. *Stipules* conspicuous, ovate-lanceolate, with subulate tips, membranous. *Leaves* very shortly petioled, $\frac{1}{4}$–$\frac{1}{3}$ inch long, spreading, often fascicled on short lateral branchlets, narrow, acicular, soft, blunt, grooved above, concave on the back, covered with soft silky hairs. *Flowers* small, sessile, sunk amongst the leaves. *Bracts* small, similar to the stipules. *Calyx-lobes* acute, rather long; *bracteoles* inserted at its base and as long as itself, linear-lanceolate. *Corolla* $\frac{1}{4}$ inch long.—This species should perhaps be referred to the section with *P. prostrata*, the flowers being terminal on very short lateral branches, but the fruit is evidently lateral.

16. **Pultenæa fasciculata** (Benth. in Ann. Mus. Vind. ii. 82); fruticulus diffuse ramosus erectus v. ramis ascendentibus, ramulis argenteo-sericeis glabratisve, stipulis setaceis conspicuis, foliis acicularibus teretibus pungenti-mucronulatis antice canaliculatis appresse sericeis glabratisve, floribus axillaribus sessilibus, bracteis paucis stipulæformibus v. nullis, calyce campanulato sericeo, lobis brevibus, bracteolis basi tubo insertis tubo multo brevioribus, legumine oblique ovato acuminato pubescente. (*Gunn*, 308.)

Hab. Summit of the Western Mountains, and Arthur's Lake, elevation 2–3000 feet, *Lawrence, Gunn.*—(Fl. Jan. Feb.)

Distrib. Cobboras Mountain, South-east Australia, *Müller.*

A remarkably distinct little species, with the habit of *P. tenuifolia*, but differing widely in the rough leaves with pungent apices, and in the bracteoles of the calyx being very short, as also in the more lateral flowers and fewer bracts.—*Stems* prostrate, glabrous or more or less silvery with silky appressed hairs. *Stipules* conspicuous, lanceolate-subulate, sometimes squarrose. *Leaves* $\frac{1}{3}$ inch long, acicular, terete, grooved down the front, glabrous or covered with appressed silky hairs. *Calyx* campanulate, very silky and shining.

Obs. *Pultenæa Bæckioides* (Benth. in Ann. Vienn. Mus. ii. 83), said to be found in Van Diemen's Land, is unknown to me.

Gen. VIII. HOVEA, *Br.*

Calyx bilabiatus, labio superiore lato, retuso, inferiore minore, tripartito. *Vexillum* explanatum. *Stamina* 10, monadelpha, filamento vexillari plus minus libero. *Ovarium* 2–3-ovulatum. *Stylus* glaber. *Legumen* subrotundum, ventricosum. *Semina* strophiolata.—Frutices *v.* fruticuli; foliis *alternis, simplicibus, stipulatis;* floribus *axillaribus, purpureis v. violaceis;* pedicellis *solitariis v. geminis, unifloris v. pauciforis.*

An Australian genus of about twenty known species, more than half of which are confined to the south-western part of that continent; the remainder are South-east Australian, except one or two tropical species.—*Shrubs* or very small subherbaceous plants, with alternate, stipulate, simple leaves, and axillary blue flowers. *Calyx* two-lipped, upper lip lobed or retuse. *Corolla* papilionaceous. *Ovary* two- or three-ovuled. *Stamens* ten, monadelphous, the upper more or less free. *Pod* orbicular or nearly so, turgid, one- to three-seeded. (Named in honour of *A. P. Hove*, a Polish botanist.)

1. **Hovea purpurea** (Sweet, Flora Australasica, t. 13); frutex erectus, ramis incano-pubescentibus, foliis lineari-oblongis obtusis mucronatis subtus incano-tomentosis, floribus solitariis binisve, calyce tomentoso, legumine orbiculari turgido ferrugineo-tomentoso.—*Bot. Reg. t.* 1123. (*Gunn*, 674, 138.)

Var. *β. montana;* minor, glabrata v. ramulis foliis subtus leguminibusque dense ferrugineo-tomentosis. (*Gunn*, 800.)

Hab. Abundant throughout the Island, in many soils and situations; var. *β*, on the mountains.—(Fl. Sept. Dec.) (*v. v.*)

Distrib. New South Wales and South-east Australia. (Cultivated in England.)

This is one of the most common and variable plants in East Australia, being found from lat. 30° to the south extreme of Tasmania, varying extremely in stature, habit, pubescence, and the length and breadth of the leaves. It forms an erect or prostrate shrub, sometimes attaining a height of 6–8 feet, at others not above a foot. Mr. Gunn has endeavoured in vain to establish some differences amongst its varieties, and I am quite unable to find the smallest specific character amongst these.—*Branches* covered with a hoary or ferruginous pubescence. *Leaves* ½–1½ inch long, narrow, linear-oblong, blunt or mucronate; margins recurved, very coriaceous; upper surface glossy; under densely tomentose. *Flowers* bright blue, generally in pairs in the axils of the leaves, sometimes solitary, shortly pedicelled. *Pods* extremely variable in size. *Seed* generally solitary, dark brown.—I have not united the *H. purpurea* with *H. lanceolata*, though quite unable to trace any character by which the originally described and figured specimens may (without fruit) be distinguished. There is however reason to believe that the true *H. lanceolata* has longer pods, and the flowers spuriously racemose from growing on short lateral branches. Mr. Smith, of the Royal Gardens, Kew, assures me that the original *H. lanceolata* of the 'Botanical Magazine' was cultivated at Kew, and had a pod in no way different from the Tasmanian one, which has also been in cultivation at Kew.

2. **Hovea heterophylla** (A. Cunn. MSS. in Herb. Hook.); procumbens, ramis ramulisque gracilibus prostratis appresse pilosis, foliis (eodem ramulo) polymorphis breviter late ellipticis elliptico-oblongis lanceolatis v. anguste linearibus acutis mucronatisve marginibus recurvis subtus appresse pilosis glabratisve, calycibus pedicellisque tomentosis, leguminibus late oblongis pubescentibus glabratisve. (*Gunn*, 139.) (Tab. XV.)

Hab. Abundant in dry and stony places in various parts of the Island, *Lawrence, Gunn, etc.*—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales and South-east Australia.

Root woody; *stem* short, stout, woody, giving off many slender, procumbent, almost filiform, terete branches, 2–10 inches long, sparingly silky or pubescent towards their tips with appressed hairs. *Leaves* shortly petioled, coriaceous, singularly variable in size and form on the same branch; the lower generally broadly elliptical-ovate, acute, mucronate, $\frac{1}{3}$–$\frac{1}{2}$ inch long; the upper (sometimes all) 1–2 inches long, narrow linear, linear-oblong or narrow elliptical, glabrous above, beneath glabrous or covered with appressed hairs, reticulated; margins recurved, apex generally mucronate. *Flowers* small, blue, pedicelled. *Pods* $\frac{1}{3}$ inch long, obliquely orbicular, acuminate. *Valves* pubescent or glabrous. *Seed* ovoid, almost black, with a large caruncula.—Plate XV. Fig. 1, 2, leaves; 3, flower; 4, vexillum; 5, ala; 6, carina; 7, stamens; 8, pistil; 9, vertical section of ovary; 10, ovule; 11, pod; 12, pod with one valve removed; 13, seed:—*all magnified.*

Gen. IX. BOSSIÆA, *Vent.*

Calyx bilabiatus, labio superiore majore, bifido, inferiore tripartito. *Vexillum* planum, subrotundum. *Stamina* 10, monadelpha, vagina integra. *Ovarium* sessile, pluri-ovulatum. *Legumen* pedicellatum, plano-compressum, polyspermum, sutura utraque incrassata.—Frutices *v.* suffruticuli; ramis *teretibus v. compressis, phyllodiiformibus, aphyllis;* foliis *dum adsunt simplicibus, alternis, stipulatis;* floribus *flavis, purpureo-variegatis;* pedicellis *bracteolatis.*

Between thirty and forty species of this genus are known, all of them confined to Australia, and equally divided between the east and west extratropical parts of the continent, a very few being common to both coasts, and there are also several tropical ones. The species are often exceedingly protean in form and habit; many are leafless, having compressed or winged stems; others have leaves, which are always alternate, simple, and stipulate.—*Flowers* pedicelled, yellow, variegated with purple. *Calyx* two-lipped; upper lip large, bifid; lower three-parted. *Stamens* ten; the filaments united into a complete tube. *Ovary* many-ovuled. *Pod* stalked, compressed, generally oblong, its margins thickened. (Named in honour of *M. Boissieu-Lamartinière,* a companion of La Peyrouse.)

1. **Bossiæa ensata** (Sieb. Plant. Exsicc. n. 434); erecta v. decumbens, aphylla, ramis complanatis, costa crassa, alis tenuissime striolatis denticulatis, denticulis floriferis, pedicellis medium versus bibracteolatis, calyce glabro, carina nuda, leguminibus lineari-oblongis glabris, seminibus 2–3 rufis transverse oblongis, caruncula crassa.—*DC. Prodr.* ii. 117; *Sweet, Fl. Australas. t.* 51. B. virgata, *Hook. Bot. Mag. t.* 3986; *Sweet, Fl. Austral. t.* 51. (*Gunn,* 176, 1059, 1059?)

Hab. Abundant throughout the Island, in various soils and situations, ascending to 4000 feet, *Lawrence, Gunn, etc.*—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales, South-east and South-west Australia. (Cultivated in England.)

A very common plant, and extremely variable in size and habit, becoming a tall shrub, 3–5 feet high, in rich soils, a dwarf plant in sterile places, and procumbent in alpine situations. I cannot detect the smallest difference in the flowers or fruit of all the forms. The South-west Australian specimens (which are perhaps the *B. rufa,* Br.) have more slender pedicels, but are otherwise identical; there is sometimes a slight fringe of hairs on the keel.—*Branches* flat, $\frac{1}{4}$–$\frac{1}{3}$ inch broad, with a stout, prominent, flexuose costa, and thick, coriaceous, obscurely striate wings, that are toothed occasionally at the margins. *Flowers* solitary from the teeth at the margins of the branches. *Pedicels* variable in length, never exceeding $\frac{1}{2}$ inch, with two bracteæ at the base and two deciduous ones on the middle, glabrous, as is the calyx. *Flowers* $\frac{1}{3}$ inch long. *Pods* flat, $\frac{1}{2}$–1 inch long, red-brown. *Seeds* transversely oblong, red-brown.

2. **Bossiæa prostrata** (Br. in Hort. Kew. iv. 266); parvula, caule brevi lignoso, ramis obscure compressis teretibusve prostratis gracilibus appresse puberulis, foliis petiolatis ellipticis oblongis lanceolato-ovatis ovato-cordatisve mucronulatis planis glabris v. subtus pilosulis, pedicellis pubescentibus foliis longioribus basi bracteolatis, legumine breviter pedicellato lineari latiusculo.—*DC. Prodr.* ii. 117; *Sims, Bot. Mag. t.* 1493; *Sieb. Pl. Exsicc.* 351. (*Gunn,* 472.)

Hab. Abundant in dry soil throughout the Island, *Gunn, etc.* (Fl. Nov.) (*v. v.*)
Distrib. New South Wales and South-east Australia. (Cultivated in England.)

A small, very variable species.—*Stem* short, stout, woody. *Branches* slender, pubescent, trailing on the ground, terete or slightly compressed, with a thickened line on each side. *Stipules* small, ovate, acute, brown. *Petiole* slender, one line long. *Leaves* thin, but firm in texture, ¼–½ inch long, varying from ovate-cordate to ovate-lanceolate, elliptical and oblong, entire, blunt or sharp, mucronate, glabrous or pilose, reticulated. *Pedicels* erect, longer than the leaves, slender, pilose, ebracteate, except at the base. *Flowers* ½ inch long. *Calyx* pubescent. *Standard* emarginate, or two-lobed. *Pod* 1 inch long (or less), linear, ¼ inch broad, suddenly acuminate. *Seeds* 6–10, oblong, reniform, compressed, pale red-brown.

3. **Bossiæa cordigera** (Benth.); fruticulus diffuse ramosissimus, ramis gracilibus teretibus, ramulis pubescentibus, foliis petiolatis parvis late cordatis acutis pilosulis, pedicellis foliis pluries longioribus pilosis supra medium bracteolatis, calycis tubo conico limbo venoso late explanato labio superiore lobis uncinatis recurvis inferiore parvo, legumine gracile pedicellato lineari-oblongo acuminato. (*Gunn*, 171.) (Tab. XVI.)

Hab. Widely distributed over the northern parts of the Island, from the sea-level to 4000 feet, *Lawrence, Gunn.*—(Fl. Nov.)

A very pretty species, of which Gunn says that it is one of the least variable leguminous plants of Tasmania. It generally forms a subscandent or straggling, diffusely branched, very slender plant.—*Branches* a few inches to several feet long, terete, slender; terminal ones filiform, pubescent. *Stipules* ovate-subulate, brown. *Petioles* ½ line long. *Leaves* very small, uniform in size over all the specimens and from every locality, broadly cordate, acute, about ⅛–¼ inch broad, rather membranous, glabrous or pubescent. *Pedicels* axillary, very long, slender, pubescent, 1–1½ inch long, bracteate at the base, and with two small bracteoles above the middle. *Flower* large, ¾ inch long. *Calyx* remarkable for its short conical tube and spreading veined limb, with thickened edges, upper lip large, recurved, with broad uncinate lobes; lower lip small, of three lanceolate teeth. *Standard* with a slender claw; *blade* broader than long, two-lobed. *Pod* with a very long pedicel, linear-oblong, acuminate. *Seeds* small, on slender funiculi, oblong-reniform, mottled red-brown.—Plate XVI. Fig. 1, branch and flower; 2, flower with corolla removed; 3, vexillum; 4, ala; 5, keel; 6, stamen; 7, pollen; 8, ovary; 9, vertical section of ovary; 10, pod with valve removed; 11, seed; 12, vertical section of seed:—*all but fig.* 10 *magnified.*

4. **Bossiæa cinerea** (Br. Hort. Kew. ed. 2. iv. 266); frutex erectus, ramis robustis teretibus, foliosis ramulisque pubescenti-tomentosis, stipulis setaceis, foliis breviter petiolatis triangulari-ovatis ovato-lanceolatisve basi latioribus subcordatis coriaceis acuminatis marginibus recurvis pungentibus glabris v. supra scabris subtusque pubescentibus, pedicellis foliis subæquilongis medio bibracteolatis calyceque campanulato glabris, limbo intus puberulo, leguminibus elliptico- v. oblongo-lanceolatis acuminatis glabris.—*Bot. Reg. t.* 306; *DC. Prodr.* ii. 117. B. cordifolia, *Sweet, Fl. Austral. t.* 20. (*Gunn*, 474, 135, 1058.)

Hab. Abundant in dry situations throughout the Island, *Lawrence, etc.*—(Fl. Oct. Nov.) (*v. v.*)
Distrib. South-eastern Australia.

A very common and rather variable shrub, 2–4 feet high, generally with erect, strict branches, sometimes straggling.—*Branches* terete, stout or slender, more or less pubescent, tomentose, or villous. *Leaves* crowded, spreading, ovate-cordate or ovate-lanceolate or triangular-ovate, ¼–¾ inch long, acuminate, rigid, pungent, nearly sessile, with small subulate stipules, generally scabrous above and more or less pubescent below, rarely wholly glabrous. *Pedicels* rather longer or shorter than the leaves, glabrous, bibracteolate at the middle. *Flowers* nearly ½ inch long. *Calyx* campanulate, glabrous, pubescent within. *Pods* pedicelled, elliptic-lanceolate, acuminate, blue-black, ¾–1 inch long. *Seeds* few, large, broadly transversely oblong, subreniform, dark red-brown.—Dr. Müller sends a curious variety of this plant from South Australia (along with the common form), having narrow, linear, curved leaves, with long acuminate points.

Gen. X. PLATYLOBIUM, *Smith.*

Calyx basi bracteolatus, bilabiatus, labio superiore maximo rotundato, bifido, inferiore trifido. *Vexillum* planum, subrotundum. *Stamina* 10, monadelpha. *Ovarium* subsessile, pluri-ovulatum. *Legumen* plano-compressum, sutura dorsali alatum, polyspermum. *Semina* strophiolata.—Frutices; foliis *oppositis, simplicibus, stipulatis;* floribus *axillaribus, flavis.*

A small genus of seven or eight species, of which two are found in South-western Australia, and the others on the eastern side.—Small shrubs, with simple, opposite, stipulate leaves. *Flowers* axillary, yellow. *Calyx* with scarious bracts at the base, two-lipped; upper lip large, bifid; lower three-parted. *Stamens* ten, monadelphous. *Pod* compressed, winged, many-seeded. *Seeds* strophiolate. (Named from πλατυς, *broad*, and λοβος, *a pod.*)

1. **Platylobium triangulare** (Br. Hort. Kew. ed. 2. iv. 266); caulibus prostratis gracilibus, foliis triangularibus ovato-triangularibusve angulis apiceque spinescentibus, bracteis imbricatis magnis pedicellum longe superantibus, legumine calyce dimidio longiore.—*DC. Prodr.* ii. 116; *Sims, Bot. Mag. t.* 1508. P. obtusangulum, *Hook. Bot. Mag. t.* 3258. P. macrocalyx, *Meisner.* (*Gunn,* 64.)

Hab. Common in many parts of the Island, as near Launceston, Rocky Cape, and the falls of the Derwent.—(Fl. Nov.) (*v. v.*)

Distrib. South-east Australia. (Cultivated in England.)

A variable species, easily recognized by the very short pedicels, large, long bracts, and short pod. *Stems* slender, straggling, often prostrate, glabrous or pubescent (villous in some South-eastern Australian specimens), 6–18 inches long, sparingly branched. *Stipules* small, ovate. *Leaves* ¾–1½ inch long, shortly petioled, triangular or ovate-triangular, retuse or cordate, rarely rounded at the base; angles and apex pungent; margin recurved; under surface glabrous or pubescent. *Bracts* distichous, ovate, concave, imbricating, covering the pedicel and half of the calyx; upper gradually larger, glabrous, with downy margins. *Flowers* extremely variable in size. *Calyx* villous with silky hairs. *Pods* ¾ inch long, nearly ½ inch broad, glabrous or silky.—This is certainly Brown's *P. triangulare*, according to the figure in the 'Botanical Magazine,' taken from specimens grown from the seeds sent to England by Brown himself. The meaning of the character given in 'Hortus Kewensis' is generally misunderstood; the bracts are inserted (as Brown described them) at the base of the pedicel, and at its apex, not on its middle. He is silent as to the relative length of bracts and pedicel.

2. **Platylobium Murrayanum** (Hook. Bot. Mag. t. 2359); caulibus gracilibus prostratis, foliis triangularibus v. ovato- v. cordato-triangularibus apice et angulis spinescentibus, bracteis parvis pedicellis elongatis tomentosis multoties brevioribus, legumine calycem multoties superante. (*Gunn,* 798.)

Hab. In light sandy soil, at Rocky Cape and Georgetown, *Gunn.*

Distrib. South-east Australia. (Cultivated in England.)

So similar in habit and general appearance to *P. triangulare* (with which Mr. Gunn finds it growing intermixed), as to require no detailed description; it differs from that plant in its very small bracts, long pedicels, small calyx, and large linear-oblong pod, which is much longer than the calyx.—I have seen South-east Australian specimens without the lateral angles to the leaves, which are consequently simply cordate, as in *P. formosum.*

3. **Platylobium formosum** (Willd. Sp. Pl. iii. 921); suberectum, foliis ovatis ovato-cordatisve apice pungentibus glaberrimis grosse reticulatim venosis, bracteis pedicello multoties brevioribus imbricatis, pedicellis tomentosis folio brevioribus, leguminis pedicello calycem parvum multoties superante.—*Smith, Nov. Holl.* 17. *t.* 6; *DC. Prodr.* ii. 116; *Vent. Jard. Malm. t.* 31; *Curt. Bot. Mag. t.* 469; *Br. Hort. Kew. ed.* 2. iv. 266. Cheilococca apocynifolia, *Salisb. Prodr.* 412. (*Gunn,* 1016.)

Hab. Plentiful about Mount Direction to the north-east of Launceston, but not hitherto found elsewhere in the Colony, *Gunn.*—(Fl. Oct.)

DISTRIB. New South Wales and South-east Australia. (Cultivated in England.)

A suberect plant, more robust than the preceding.—*Leaves* ovate or ovate-cordate, not angled, spinous at the acute apex only. *Bracts* short, distichous, imbricated at the base of the pedicel. *Pedicels* shorter than the leaves, with two small red-brown bracts beneath the small calyx. *Flowers* about ½ inch long. *Pod* with a slender pedicel which is much longer than the calyx, 1 inch long, ⅓ inch broad, blunt or rounded at both ends.

Gen. XI. GOODIA, *Salisb.*

Calyx bilabiatus, labio superiore breviore semibifido, inferiore trifido. *Vexillum* planum, subrotundum. *Stamina* 10, monadelpha, vagina integra. *Ovarium* pauci-ovulatum. *Legumen* stipitatum, basi oblique angustatum, plano-compressum, 2–4-spermum.—Frutices; foliis *exstipulatis alternis pinnatim trifoliolatis*; floribus *racemosis flavis*; pedicellis *ebracteolatis*.

A small genus, consisting of only three known species, whereof two are South-east Australian and Tasmanian, and one inhabits South-west Australia. It may be recognized at once by the shrubby habit, trifoliolate leaves, racemes of yellow flowers, two-lipped calyx, of which the lips are not deeply divided, and by the two- to four-seeded pod, which is veined and obliquely narrowed at the base. (Named in honour of *Dr. Mason Good*, an eminent physician.)

1. **Goodia latifolia** (Salisb. Par. Lond. t. 41); glaberrima, foliolis late oblongis obovatis obcordatisve obtusis apiculatisve, racemis elongatis, leguminibus longe stipitatis.—*Bot. Mag. t.* 958; *DC. Prodr.* ii. 117. (*Gunn*, 209.)

HAB. Common in various parts of the Island, as at Circular Head, Rocky Cape, the Western Mountains, etc., *Lawrence, Gunn.*—(Fl. Sept.) (*v. v.*)

DISTRIB. New South Wales and South-east Australia. (Cultivated in England.)

A handsome bush, 3–6 feet high, with spreading branches, and long racemes of flowers, like a small Laburnum. Everywhere glabrous, except at the tips of the young branches and calyx.—*Branches* slender, terete, brittle. *Petiole* slender, 1–2 inches long. *Leaflets* ½–¾ inch long, membranous, oblong-obovate or obcordate, sessile, entire, glabrous. *Racemes* terminal, 2–6 inches long. *Flowers* on slender pedicels, golden-yellow, ½ inch long. *Calyx* glabrous or slightly puberulous. *Pod* with its slender stalk 1½ inch long, lanceolate, with an abruptly incurved or straight apex, thickened along the dorsal suture, and obscurely winged, transversely wrinkled. *Seeds* one to four, black, with a large strophiolus.

2. **Goodia pubescens** (Sims, Bot. Mag. t. 1310); pubescens, foliolis obovatis obovato-oblongisve cuneatisve obtusis, racemis brevibus.—*Br. in Hort. Kew. ed.* 2. iv. 270; *DC. Prodr.* ii. 117. (*Gunn*, 208.)

HAB. Common throughout the Island in rocky and shady places, *Gunn, etc.*—(Fl. Sept.) (*v. v.*)

DISTRIB. South-east Australia? (Cultivated in England.)

A smaller shrub than the former, about 4 feet high, very pubescent on the branches, leaves, and racemes, sometimes tomentose. *Petioles* ½ inch long. *Leaflets* ¼–½ inch long, oblong-obovate or cuneate, rounded at the apex. *Racemes* short, 1–2 inches long. *Calyx* pubescent.—I have not seen the fruit, which is described as being glabrous and two-seeded.

OBS. *G.? polysperma*, DC. Mém. Soc. Hist. Nat. Genev. ii. 133 (*Cytisus tomentosus*, Andr. Bot. Rep. t. 237), said to be found in Australia or Tasmania, is unknown to me, if a member of this genus.

Gen. XII. LOTUS, *Linn.*

Calyx campanulatus, quinquefidus. *Vexillum* rotundatum. *Alæ* margine superiore conniventes. *Carina* ascendens, angustato-rostrata. *Stamina* 10, diadelpha, alterna longiora, apice dilatata. *Ovarium*

multiovulatum. *Legumen* lineare, rectum, cylindraceum, polyspermum, uniloculare v. septatum.—Herbæ *erectæ v. diffuse procumbentes;* foliis *alternis, trifoliolatis;* stipulis *liberis, foliaceis;* pedunculis *axillaribus terminalibusque, apice floriferis;* floribus *plerisque umbellatis, albis roseis v. flavis.*

A very large European and especially Mediterranean genus, of which the four or five Australian species are almost the only ones known in the Southern Hemisphere; none inhabit New Zealand, nor the tropics, nor extra-tropical African or South America. What renders the Australian distribution of the genus most remarkable is the occurrence of *L. corniculatus*, one of the European species.—*Herbs*, generally prostrate, with trifoliolate alternate leaves, and large leafy stipules. *Flowers* generally sessile and umbellate at the apex of slender peduncles, with a bract at the base of each. *Calyx* five-toothed. *Corolla* papilionaceous, with an acute almost rostrate keel. *Pod* cylindrical, straight, two-valved, one-celled or divided by many septa into as many cells, many-seeded. (Name of unknown derivation.)

1. **Lotus corniculatus** (Lin. Sp. Pl. 1092); caulibus prostratis, stipulis ovatis, foliolis ovalibus obovatisve obtusis v. subacutis, bracteis foliaceis, pedunculis elongatis, capitulis depressis 3–8-floris, floribus flavis, calyce campanulato, lobis acutis corolla multoties brevioribus, legumine tereti, seminibus reniformibus. —*DC. Prodr.* ii. 214; *Engl. Bot. t.* 2090. (*Gunn*, 83.)

Hab. Abundant in rich soil and marshy places, affording good pasturage, ascending to 4000 feet, *Lawrence, Gunn.*—(Fl. Dec.)

Distrib. New South Wales and South-east Australia. Throughout Europe and West Asia, from Britain to the mountains of Afghanistan, and along the Himalaya to Nipal. North Africa, Abyssinia, and the Canary Islands.

A straggling herb, with many ascending branches spreading from the root, and bearing erect peduncles crowned with a small capitulum or depressed umbel of yellow or reddish flowers.—*Leaves* glabrous in the Australian specimens. *Stipules* large, ovate or oblong. *Petioles* short, $\frac{1}{2}$ inch long; *leaflets* sessile, $\frac{1}{4}$–$\frac{3}{4}$ inch long, more or less obovate. *Flowers* sessile, with leafy bracts at the base. *Calyx* glabrous or pilose, its segments acute, narrow. *Pod* $1\frac{1}{2}$–2 inches long, $\frac{1}{5}$ inch in diameter, divided into many cells by spongy dissepiments. *Seeds* small, kidney-shaped, black.—This appears to be undoubtedly indigenous in Australia and Tasmania, and is so abundant in many places as to afford an excellent pasturage.

2. **Lotus australis** (Andr. Bot. Rep. 624); pubescens, caule procumbente diffuse ramoso, stipulis bracteisque oblongo-lanceolatis, foliolis obovato-lanceolatis subacutis, pedunculis elongatis brevibusve, floribus roseis breviter pedicellatis, calycibus pilosis laciniis subulatis, legumine tereti, seminibus reniformibus. —*Sims, Bot. Mag.* 1365; *DC. Prodr.* ii. 212. L. albidus, *Lodd. Bot. Cab. t.* 1063. L. lævigatus, *Benth. in Mitch. Journ. p.* 62.

Hab. Sandy shores on the north coast, *Gunn.* Macquarrie Harbour, *A. Cunningham.*—(Fl. Dec.)

Distrib. New South Wales, from the tropic southwards, South-east Australia, Isle of Pines (New Caledonia). (Cultivated in England.)

A much larger and more robust species than *L. corniculatus*, generally very pubescent, with narrower stipules, leaflets, and bracts, stouter pedicels, and larger rose-coloured or purplish flowers. It is a very handsome plant.

Gen. XIII. PSORALEA, *L.*

Calyx campanulatus, quinquefidus. *Vexillum* marginibus reflexum. *Stamina* 10, diadelpha; antheræ conformes v. alternæ steriles. *Ovarium* 1-ovulatum. *Legumen* calyce inclusum, indehiscens, membranaceum, monospermum. *Semen* interdum cum endocarpio leguminis coalitum.—Frutices *v.* herbæ; foliis *imparipinnatis, trifoliolatis v. unijugis, stipulatis;* floribus *spicatis capitatisve.*

A very remarkable genus, which abounds in the tropical and warm parts of North and South America, and in

South Africa. About ten Australian species are known, chiefly natives of the south-east coast, two or three being tropical and South-west Australian. The majority of the species are glandular and shrubby; but all the Australian ones are herbaceous.—*Leaves* alternate, pinnate-trifoliolate, or with but one leaflet. *Flowers* generally capitate, or spiked. *Calyx* five-cleft. *Stamens* diadelphous. *Ovary* one-ovuled. *Pod* small, included within the calyx, membranous, indehiscent, one-seeded. (Name from ψωραλεος, *scurfy*; in allusion to the hairs on the calyx.)

1. **Psoralea Gunnii** (Hook. fil.); caulibus gracilibus elongatis prostratis glabris v. parce pilosis, stipulis ovato-lanceolatis, petiolis gracilibus, foliis trifoliolatis, foliolis ellipticis v. oblongis v. lanceolatis lineari-oblongisve acutis atro-punctulatis, pedunculis axillaribus elongatis gracilibus sulcatis superne pilosis, capitulis ovoideis densifloris, calyce glanduloso strigoso-piloso, pilis atris. (*Gunn*, 1061.)

Hab. Woolnorth, *Gunn.*—(Fl. Dec.)

Distrib. South-eastern Australia.

A slender straggling plant.—*Stems* a foot long and upwards, sparingly branched, decumbent, striate, glabrous or covered with small black hairs. *Petioles* 2–4 inches long, slender. *Leaflets* three, sessile, elliptical or oblong or linear, glabrous, entire, covered with small black glandular dots, 1–1½ inch long. *Peduncles* very long, slender, and deeply grooved, 6–10 inches long. *Capitula* about an inch long, ovoid or oblong. *Flowers* crowded. *Calyx* covered with rigid black hairs, divided beyond the middle into five narrow lobes; *bracts* broadly ovate, acuminate, glandular, shorter than the calyx. *Standard* orbicular, emarginate, contracted into a broad short claw. *Wings* linear-oblong, produced behind into a lobe over the claw. *Keel* adherent to the wings, its leaflets connate at the apex. *Pod* broadly oblong, deeply wrinkled on the surface, rather fleshy. *Seed* filling the cavity of the pod, transversely oblong, with a shining pale brown testa and small strophiolus.

Gen. XIV. INDIGOFERA, *Linn.*

Calyx parvus, urceolato-campanulatus, quinquefidus. *Vexillum* reflexum. *Stamina* 10, diadelpha. *Antheræ* conformes v. alternæ steriles. *Ovarium* 2-multi-ovulatum. *Legumen* teretiusculum v. tetragonum, rectum v. falcatum, 2-polyspermum, intus septis membranaceis multiloculare. *Semina* cubica.—Herbæ *v.* frutices, *pilis sæpissime medio affixis muniti*; foliis *imparipinnatis, plerumque multijugis*; stipulis *petiolo inferne adnatis*; pedunculis *axillaribus, uni-paucifloris racemosisve*; pedicellis *unibracteatis*; floribus *roseis purpureisve.*

A very extensive tropical genus, including the Indigo plant. Many of the species abound in a blue colouring matter. About twelve are Australian, and most of them tropical, several being also natives of India.—Herbs or shrubs, with alternate, stipulate, pinnate leaves, the latter occasionally reduced to a few or one leaflet. *Flowers* usually racemose, pedicelled with a bract at the base of the pedicel. *Calyx* broad, urceolate, five-toothed. *Corolla* with a recurved standard. *Pod* many-seeded, rarely few- or one-seeded, terete or angled, narrow, divided internally into many loculi by transverse septa. *Seeds* angular, cubical. (Name from *Indigo* and *fero*, to bear.)

1. **Indigofera australis** (Willd. Sp. Pl. iii. 1235); frutex erectus, foliolis 5–10-jugis breve petiolulatis lineari-oblongis obtusis retusisve v. apice bilobis subtus tenuissime appresse pilosis, racemis axillaribus multifloris nutantibus, bracteis parvis, pedicellis calycem subæquantibus, legumine tereti polyspermo, seminibus opacis punctatis.—*DC. Prodr.* ii. 226. I. australis *et* I. gracilis, *Sieber, Pl. Exsicc.*; *Bot. Mag. t.* 3000. (*Gunn*, 463.)

Hab. Abundant in many places throughout the Island.—(Fl. Sept. Oct.) (*v. v.*)

Distrib. Subtropical Eastern Australia, throughout New South Wales and South-eastern Australia. (Cultivated in England.)

A very common and handsome shrub, 2–3 feet high. *Stems* and *branches* erect, brittle, glabrous, angled. *Leaves* 2–4 inches long. *Leaflets* in six to ten pairs, shortly petiolulate, linear-oblong, ⅓–1¼ inch long, blunt, retuse

or bilobed at the apex, rarely acute, membranous, glabrous above, covered beneath with minute appressed hairs, which are inserted by their middle to the surface of the leaf. *Racemes* shorter than the leaves, erect, nodding. *Flowers* numerous, bright pink, $\frac{1}{3}$ inch long. *Pods* cylindrical, 1–2 inches long, strict, glabrous, acute, covered internally with a mottled lining membrane. *Seeds* opaque, black, pitted on the surface.

Gen. XV. SWAINSONIA, *Salisb.*

Calyx urceolato-campanulatus, 5-dentatus. *Vexillum* amplum. *Stamina* 10, diadelpha. *Stylus* longitudinaliter barbatus. *Legumen* ovatum, inflatum, polyspermum. *Semina* cordato-reniformia, estrophiolata. —Suffruticuli *v.* herbæ; foliis *alternis, imparipinnatis;* stipulis *deciduis;* racemis *axillaribus;* floribus *purpureis v. coccineis.*

A small Australian genus, of which about ten species are known, all confined to the eastern half of that continent and to Tasmania.—*Herbs*, sometimes with half-shrubby stems. *Leaves* alternate, imparipinnate, with deciduous stipules. *Flowers*, red or purple, in axillary racemes; pedicels bracteate at the base. *Calyx* campanulate, five-toothed. *Corolla* papilionaceous. *Standard* ample. *Stamens* 10, diadelphous. *Ovary* many-ovuled; the style bearded along the back. *Pod* oblong or ovoid, turgid, inflated. *Seeds* (in *S. lessertiæfolia*) numerous, cordate-reniform; *funiculus* slender, without a strophiolus. (Named after *Mr. W. Swainson*, an eminent zoologist.)

1. **Swainsonia lessertiæfolia** (DC. Ann. Sc. Nat. iv. 99); caule decumbente herbaceo ramoso, ramis ascendentibus gracilibus glabris puberulisve, stipulis ovato-oblongis obtusis, foliolis subremotis 6–10-jugis sessilibus lineari-oblongis ellipticis linearibusve obtusis subtus petioloque appresse pubescentibus, pedunculo gracili elongato superne subsericeo, racemo 8–15-floro, bracteolis parvis, floribus breve pedicellatis, calycibus appresse pilosis, floribus roseis, legumine oblongo-lanceolato utrinque acuminato.—*DC. Prodr.* ii. 271. (*Gunn*, 466.)

Hab. Common near Woolnorth, and in the Islands of Bass' Straits, *Gunn*. (Fl. Nov.)

Distrib. South-eastern Australia.

A straggling, decumbent, herbaceous plant, sometimes woody at the very base. *Stems* slender, terete, branching. *Branches* ascending, 8–12 inches long, glabrous or with appressed pubescence. *Stipules* oblong-lanceolate, blunt. *Leaves* 3–5 inches long; *petiole* slender, covered with minute silvery appressed hairs, as are the leaflets beneath. *Leaflets* of six to ten pairs, sessile, $\frac{1}{2}$–1 inch long, varying in shape from broadly-oblong to linear- or lanceolate-oblong, blunt, sometimes retuse, membranous or herbaceous. *Peduncles* axillary, 6–10 inches long, above pubescent or silky. *Raceme* many-flowered. *Flowers* pedicelled, $\frac{1}{2}$ inch long. *Calyx* covered with black appressed hairs. *Pods* large for the size of the plant, black, lanceolate-oblong, acuminate at both ends, inflated. *Seeds* numerous, black, cordate; *testa* opaque, covered with large, shallow, scattered pits.—Mr. Gunn remarks that cattle will not eat this species.

Gen. XVI. DESMODIUM, *DC.*

Calyx bilabiatus, labio superiore bifido, inferiore tripartito. *Vexillum* rotundatum. *Stamina* 10, diadelpha (rarius monadelpha). *Ovarium* sessile, multi-ovulatum. *Legumen* multi-articulatum; articulis secedentibus, compressis, 1-spermis, indehiscentibus. *Semina* reniformia.—Herbæ *v.* suffrutices; foliis *pinnatim trifoliolatis v. unifoliolatis;* racemis *terminalibus;* floribus *plerisque purpureis.*

A very large genus of tropical shrubs and weeds, of which remarkably few (only six) species have hitherto been discovered in Australia; of these most are tropical, and several are also natives of India.—Herbs or shrubs. *Leaves* alternate, stipulate, generally trifoliolate. *Flowers* in terminal racemes. *Calyx* usually with deciduous bracts, two-lipped; upper lip bifid, lower three-parted. *Corolla* papilionaceous. *Stamens* 10, diadelphous (or monadelphous).

Ovary many-ovuled. *Pod* of many joints, which separate from one another; joints one-seeded, indehiscent. (Named from δεσμος, *a chain*, which the jointed pod resembles.)

1. **Desmodium Gunnii** (Benth. MSS.); pusillum, caule basi lignoso, ramis gracilibus teretibus glabris v. pilosiusculis, stipulis majusculis ovatis acuminatis striatis, foliolis obovato-cuneatis obcordatisve sessilibus glabris pilosiusculisve, stipellis subulatis, racemis 2–3-floris, pedicellis puberulis basi bracteatis, bracteis ovatis acutis, calyce pubescente breviter campanulato, stamine vexillari libero, leguminis 4–6-articulati dense pubescentis sutura utraque sinuata, articulis elliptico-oblongis. (*Gunn*, 243.)

Hab. Northern coast: Emu Bay, Circular Head, etc., *Milligan, Gunn.* (Fl. Feb. March.)

Distrib. New South Wales.

Very nearly allied to *D. varians*, Lab., which is the *D. Tasmanicum*, F. Müller, a species however not found in Tasmania, and which has differently-formed joints to the pod, and the upper suture quite straight.—A small, wiry, straggling plant, 8–12 inches long. *Stem* woody, and prostrate at the base. *Branches* ascending, sparingly leafy. *Stipules* ovate-acuminate, striate, $\frac{1}{8}$ inch long. *Petioles* slender, $\frac{1}{2}$ inch long. *Leaflets* three, nearly sessile, as long as the petioles, broadly obovate-cuneate or obcordate, glabrous or pilose. *Flowers* small, pedicelled, solitary or two together, forming a few-flowered irregular raceme at the apex of the branches, $\frac{1}{6}$ inch long, rose-coloured. *pedicel* sometimes an inch long, very slender, pubescent. *Calyx* broadly campanulate, narrow at the base, pubescent; *lobes* short, broad. *Stamens* diadelphous. *Pod* nearly 1 inch long, straight, sinuate along both sutures, of four to six elliptical-oblong joints, covered with short hooked hairs, causing the joints to adhere to paper in drying, etc.—This curious little species is one of the most southern of the genus, and referable to the section *Heteroloma* of Bentham (Plant. Junghuhn. p. 224), characterized by the free upper stamen, and to the subsection *Lasiphora*, with trifoliolate leaves and subpaniculate inflorescence; it however differs from its near allies of that section in the upper suture of the pod being almost as sinuate as the lower, whence the joints are not oblique, but almost exactly oblong.

Gen. XVII. KENNEDYA, *Vent.*

Calyx bilabiatus, labio superiore bidentato, inferiore trifido. *Vexillum* obovato-oblongum, reflexum, alis æquilongum. *Carina* elongata, alas æquans v. superans. *Stamina* diadelpha. *Ovarium* pluri-ovulatum. *Legumen* oblongo-lineare, compressum, intus septis cellulosis pluriloculare. *Semina* strophiolata.—Frutices v. suffruticuli *volubiles v. prostrati;* foliis *alternis, stipulatis, trifoliolatis;* pedunculis *axillaribus, pauci-floris, bracteatis;* floribus *rubris.*

About seven species of this genus are known, all natives of Australia, and scattered over various parts of that continent.—*Shrubs* or half-herbaceous twining or prostrate plants, with alternate stipulate trifoliolate leaves, and axillary peduncles, bearing a few red large flowers. *Calyx* two-lipped. *Standard* short, reflexed. *Carina* narrow, as long as or longer than the wings. *Stamens* diadelphous. *Ovary* many-ovuled. *Pod* linear, turgid, straight, divided into many transverse one-seeded loculi by cellular septa. (Named in honour of *Mr. Kennedy*, an eminent London nurseryman.)

1. **Kennedya prostrata** (Br. Hort. Kew. ed. 2. iv. 299); pubescens v. villosa, caulibus vage ramosis prostratis, stipulis bracteisque late ovato-cordatis, foliolis petiolulatis orbicularibus obcuneatis obovatis obcordatisve, pedunculis 2-floris, carina recta vexillo longiore, legumine tereti v. compresso lineari-acuminato pubescente.—*DC. Prodr.* ii. 383. Glycine coccinea, *Curt. Bot. Mag.* 270. (*Gunn*, 26.)

Hab. Abundant throughout the Island in dry and stony places, etc.—(Fl. Oct. Nov.) (*v. v.*)

Distrib. New South Wales and South-east Australia.

A very common and handsome pubescent or villous plant.—*Stems* short, much branched; *branches* much divided, 1–2 feet long, prostrate, slender. *Stipules* and *bracts* broadly cordate, acute. *Petioles* $\frac{1}{2}$–1 inch long. *Leaflets* very variable in shape, broadly obovate, obcordate or obcuneate. *Peduncles* shorter than the leaves, generally two-flowered. *Pedicels* slender, pubescent. *Calyx* villous. *Flowers* 1 inch long, bright or dull red. *Pod*

1½–2 inches long, terete or compressed, pubescent, acuminate. *Seeds* red-brown, opaque, transversely cylindrical, oblong, blunt at both ends. *Strophiolus* large.

Gen. XVIII. LEPTOCYAMUS, *Benth.*

Calyx campanulatus, subbilabiatus, 5-fidus. *Vexillum* alas oblongas superans. *Carina* alis adhærens. *Stamina* basi monadelpha, filamento vexillari sæpe ultra medium soluto. *Ovarium* sessile, pluri-ovulatum. *Legumen* lineare, compressum, intus septis cellulosis submultiloculare.—Herbæ *v.* suffrutices, *decumbentes v. volubiles;* foliis *stipulatis, pinnatim trifoliolatis;* pedunculis *axillaribus;* floribus *capitatis v. racemosis;* pedicellis *basi et infra calycem bracteatis.*

A genus of Australian plants nearly allied to *Glycine* (a large tropical genus), of which about eight species are known, chiefly natives of the east coast, one only being South-west Australian; it is also allied to *Kennedya*, but differs much from that genus in habit, and in the large vexillum.—Decumbent or twining half-shrubby or herbaceous plants, with alternate stipulate trifoliolate leaves, and elongated axillary peduncles, bearing long racemes or heads of flowers. *Calyx* campanulate, five-lobed. *Standard* broad, larger than the alæ and carina. *Stamens* ten, diadelphous, or with the upper more or less united to the others. *Pod* linear, compressed, divided into many cells by broad spongy cellular septa. *Seeds* compressed, rounded, with a small strophiolus. (Named from λεπτος, *slender*, and κυαμος, *a bean;* in allusion to the slender pods.)

1. **Leptocyamus Tasmanicus** (Benth. MSS.); herbaceus, pubescenti-pilosus, pilis caulibus petiolis pedunculisque reflexis, caule brevi, ramis breviusculis basi decumbentibus ascendentibus, stipulis ovatis obtusis, foliolis obovato-oblongis v. cuneatis obcordatisve subtus sericeo-pubescentibus, pedunculis elongatis, racemis 3–8-floris, calycis lobis brevibus latis obtusis, legumine pubescente. (*Gunn*, 242.) (Tab. XVII.)

Hab. Pastures in the northern parts of the Island: Emu Bay, Formosa, and Circular Head, *Gunn.* (Fl. Sept. Nov.)

Distrib. South-eastern Australia.

A small species, everywhere pubescent with short stiff hairs, which are reflexed on the stems, branches, petioles, and pedicels.—*Stem* short, stout, woody; *branches* short, 3–6 inches long, ascending. *Stipules* ovate, striate, blunt. *Petioles* ½–2 inches long. *Leaflets* three, sessile, obovate, obcordate, or oblong-obovate, covered below with appressed hairs. *Peduncles* 3–8 inches long, three- to eight-flowered at the apex, tomentose towards the tip. *Bracts* small, broadly ovate. *Pedicels* very short. *Flowers* ⅓–½ inch long. *Calyx* villous with appressed hairs, lobes short, blunt, with two very minute bracteoles at its base. *Pod* linear, ¾–1 inch long, curved, flat, very pubescent or almost hispid, three- to six-seeded. *Seeds* orbicular, compressed.

I have seen but one South-east Australian specimen of this plant, gathered by Mr. Gunn at Port Philip. It is very nearly allied to *Leptocyamus Latrobeanus* (*Zychia*, Müller), of the same country, which differs in the upper stamen being united with the rest, in the longer claw of the vexillum, and in the longer calycine lobes.—Plate XVII. Fig. 1, flower; 2, calyx; 3, vexillum; 4, ala; 5, carina; 6, stamens; 7, ovary; 8, longitudinal section of ovary; 9, pod; 10, seed; 11, embryo:—*all but fig.* 9 *magnified.*

2. **Leptocyamus clandestinus** (Benth. in Linn. Soc. Trans. xviii. 209); volubilis, caulibus filiformibus implexis, petiolis pedunculisque retrorsum hispido-pilosis, foliolis inferioribus ovalibus intermediis lanceolatis superioribus linearibus, lateralibus sæpius obliquis omnibus acutis utrinque v. subtus præcipue appresse pilosis, bracteis setaceis, pedicellis calyce villoso æquilongis brevissimisve, legumine lineari glabro v. piloso.—Leptolobium microphyllum *et* L. clandestinum, *Benth. in Ann. Vienn. Mus.* ii. 125. (*Gunn*, 161, 1955, 1960.)

Var. *a. clandestina;* leguminibus lineari-elongatis, seminibus transverse oblongis tuberculatis.—L. clandestinus, *Benth. l. c.* Glycine clandestina, *Wendl.; DC. Prodr.* ii. 241.

Var. *β. microphylla;* leguminibus latioribus brevioribus, seminibus punctatis rugosis v. lævibus.—L. microphyllus, *Benth. l. c.*

Hab. Common in the northern parts of the Island, climbing amongst grasses, etc., ascending to 3000 feet, *Gunn.*—(Fl. Nov. Dec.)

Distrib. New South Wales and South-east Australia.

Root thick, fusiform, elongated. *Stems* very slender, twining, filiform, covered, as well as the petioles and peduncles, with reflexed hispid hairs. *Petioles* $\frac{1}{4}$–$\frac{3}{4}$ inch long. *Leaflets* very variable in shape on all parts of the plant: on the lower leaves broad, ovate, or oblong, lanceolate on those higher up, on the terminal leaves linear; $\frac{2}{3}$–$1\frac{1}{2}$ inch long, glabrous, or more or less covered with appressed hairs on both surfaces, acute or acuminate, the lateral ones often oblique. *Peduncles* axillary, slender, very variable in length, 2–8 inches long. *Racemes* eight- to eighteen-flowered. *Flowers* $\frac{1}{3}$ inch long. *Bracts* subulate. *Pedicels* as long as the calyx or shorter, sometimes the flowers are almost sessile. *Calyx* covered with appressed hairs. *Pod* extremely variable in length, breadth, and number of seeds, $\frac{1}{4}$–2 inches long, compressed or terete, glabrous or hairy, generally eight- to ten-seeded. *Seeds* extremely variable; those in the longest pods generally the most oblong, and covered with large granulations; those in the shorter pods more orbicular and smoother; but all forms occur indiscriminately.

I am quite unable to distinguish *L. clandestinus* and *L. microphyllus;* though the seeds are often remarkably different, every intermediate form occurs, and I find both varieties on the same specimens from Gunn, who however considers them distinct. There are certainly no constant differences in the hairiness of the leaves, length of the pedicels, and calyx, these characters varying abundantly in both, and also in the same specimens.

Gen. XIX. ACACIA, *Willd.*

Flores sæpius polygami. *Sepala* 3–5, coalita v. libera, valvata. *Petala* æqualia, coalita, rarissime libera v. 0, valvata. *Stamina* numerosa, libera v. basi in columnam connata. *Ovarium* sessile v. stipitatum. *Legumen* varium, sæpius siccum, compressum, bivalve. *Semina* plerumque transversa et strophiolata.—Arbores *v.* frutices (*rarissime* herbæ); foliis *primordialibus v. omnibus pinnatis, caulinis in* Phyllodineis *ad petiolum foliiformem reductis v. in* Aphyllis *nullis;* stipulis *in* Tasmanicis *minutis v. nullis;* floribus *paucis, capitatis, spicatis, v. densissime imbricatis, flavis;* bracteolis *sæpe stipitatis, peltatis.*—*Benth. in Lond. Journ. Bot.* i. 318.

This vast and important genus, one of the largest in the vegetable kingdom, was thoroughly well elucidated by Mr. Bentham in 1842, and the result published in the work quoted under the generic character; it then contained about 340 species, of which more than half were natives of Australia. The same admirable systematist has continued his investigation of the genus, and (chiefly owing to the discoveries in South-west Australia) the Australian species now number upwards of 260, of which a revision is published in the 26th volume of the 'Linnæa.' Of these, only one is found in any other part of the globe, and is apparently the *A. Farnesiana*, which is abundant in the tropics of both the Old and New World. Of the 260 Australian species, 100 are confined to the south-west extratropical parts; about 85 inhabit the colony of New South Wales itself, of which several spread north into the tropic, and many into South-east Australia and Tasmania; 47 the south-east corner of Australia, most of which are also common either to New South Wales or to Tasmania; and there are 60 tropical species, a few of which are also found in New South Wales; about 140 species are found in South-eastern Australia. Most of the Australian species belong to sections of the genus in which the leaves are represented by flat dilated petioles; and of these sections only two or three species are found in other parts of the world, and these are confined to the Pacific Islands, with the exception of one, said to inhabit Bourbon, but which so very closely resembles a Pacific Island plant as to suggest doubts of its being truly wild in Bourbon.

The foliage and habit have afforded Mr. Bentham the only practical characters for dividing this immense genus into sections; and these, with his specific determinations, are adopted in the following descriptions of the Tasmanian

species.—Shrubs or trees (one American species is herbaceous), with alternate leaves, always pinnate on the young plant, often reduced to leaf-like petioles in the old one and in the majority of the Australian species. *Stipules* none or minute; glands often occur on the petioles of the pinnate-leaved species. *Flowers* small, yellow, collected into capitula or spikes, that are simply pedunculate, or spiked or racemed on branching peduncles, often polygamous; the perianth is wanting in a very few species. *Calyx* of three to five valvate sepals, generally campanulate, and more or less united. *Corolla* of three to five equal valvate petals, also generally united. *Stamens* very numerous, with long, cellular, flexuose filaments, and minute anthers, free or united below into a cup or perigynous disc around the pistil of the hermaphrodite flowers; in male flowers sometimes united into a column, but never into a tube. *Pollen-grains* collected into four or six masses in each anther-cell, each mass composed of sixteen grains, cohering into a sphere. *Pistil* minute; *ovary* generally many-ovuled; *style* slender, with a capitate stigma. *Pod* extremely variable, very dissimilar in the most closely allied species, so that it does not afford sectional characters of any importance, often linear, two-valved, one-celled, many-seeded, sometimes very short and broad, at others divided by cellular septa into many cells, rarely terete. *Seeds* transversely oblong.—Many of the plants of this genus yield admirable timber, and others valuable gum. The *A. mollissima* is the cognizance of Tasmania. (Name from *ακαζω, to sharpen;* in allusion to the spinescence of many species.)

Series I. *PHYLLODINEÆ.—Leaves reduced to flattened petioles.*

§ 1. Triangulares (Benth.).—*Stems not winged. Stipules spinescent, or setaceous, or* 0. *Phyllodia small, ovate, obovate, or cuneate-triangular, one-nerved, penniveined. Flowers capitate; peduncle simple.*

1. **Acacia Gunnii** (Benth. in Lond. Journ. Bot. i. 332); fruticulus parvus depressus, totus breviter puberulus v. tomentosus, stipulis setaceis obsoletisque, phyllodiis parvis ovato- v. lanceolato-triangularibus basi oblique cuneatis rectis falcatisve nervo margini inferiori approximato in spinam excurrente, angulo superiore obtusissimo rarius glandulifero, capitulis sphæricis multifloris, bracteolis peltatis lamina subulato-lanceolata.—*Benth. in Linnæa,* xxvi. 607. (*Gunn,* 423.) (Tab. XVIII.)

Hab. South Esk River, twenty-three miles from Launceston; near Hobarton, Eagle-hawk Neck, and Campbell-town, *Lawrence, Gunn, etc.*—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales.

A small bush, 2–3 feet high, very rigid and pungent, more or less covered with small short or long hairs, or glabrous. *Stipules* setaceous. *Phyllodia* extremely variable in size and form, $\frac{1}{6}$–$\frac{2}{3}$ inch long, rigid, pungent, straight or sickle-formed, broad or narrow, tapering from an obliquely cuneate base to a rigid, pungent point; upper margin convex, gibbous, or rounded, lower straight or concave, both thickened; nerve very stout. *Peduncles* longer or shorter than the leaves, pubescent; *capitula* spherical. *Sepals* five, lanceolate, spathulate, pubescent, at first united, then nearly free. *Petals* twice as long, elliptic-lanceolate, nearly free. *Stamens* very numerous; *filaments* united at the base. *Ovary* linear-oblong. *Pods* $\frac{3}{4}$–1 inch long, compressed, linear, deeply notched between each seed; margins thickened. *Seeds* nearly orbicular, compressed, mottled green and brown; funiculus slender.—Plate XVIII. Fig. 1, portion of branch, leaf, peduncle, and capitulum; 2, 3, 4, leaves of various shapes; 5, vertical section of young capitulum; 6, flower; 7, stamen; 8, anther; 9, pollen; 10, ovary; 11, vertical section of ovary; 12, ovule; 13, 14, pods; 15, vertical section of one lobe of pod; 16, seed; 17, transverse section of seed:—*all but* 13 *and* 14 *magnified.*

§ 2. Pungentes (Benth.).—*Stems not winged. Stipules setaceous, minute or* 0. *Phyllodia rigid, pungent, linear-lanceolate or subulate, terete, one-nerved, not broad and triangular at the base. Flowers capitate; peduncle simple.*

2. **Acacia Stuartiana** (F. Müll. MSS., Benth. in Linnæa, xxvi. 609); fruticulus humilis robustus diffusus glaber, phyllodiis breviter linearibus lineari-lanceolatisve strictis falcatisve pungentibus uninerviis basi angustatis, pedunculis solitariis capitulo sphærico brevioribus, bracteolis peltatis, sepalis spathulatis liberis

corollæ dimidium æquantibus, legumine late-lineari marginato.—A. siculæformis, var. β? bossiæoides, *Benth. in Lond. Journ. Bot.* i. 337. (*Gunn*, 207 *et* 207 ?) (Tab. XIX.)

Hab. South Esk River, thirty miles south of Launceston, summit of Western Mountains, and Arthur's Lake, 3–4000 feet, *Gunn*. Ouse Bridge and Falls of the Derwent, *J. D. H.*—(Fl. Dec.) (*v. v.*)

Distrib. Mountains of South-eastern Australia.

A small shrub, 2–3 feet high, with straggling, depressed, rigid, woody branches. *Stipules* very minute, ovate. *Phyllodia* $\frac{1}{4}$–$\frac{1}{3}$ inch long, very rigid, pungent, one-nerved, linear or lanceolate, acuminate, slightly contracted at the base, straight or falcate. *Capitula* on very short peduncles, spherical. *Pods* linear, pedicelled, about 1 inch long and $\frac{1}{4}$ broad, much compressed, with thickened edges; valves glaucous, bullate, membranous. *Seeds* six to ten, nearly orbicular, much compressed, jet black, shining.—Very nearly allied to *A. siculæformis* of New South Wales, but that plant has longer peduncles, and its fruit is unknown; it is improbable that it should prove the same as this, which is an alpine species.—Plate XIX. Fig. 1, branch, leaf, and capitulum; 2, flower; 3, ovary; 4, pod; 5, seed; 6, 7, seed; 8, transverse section, and 9, longitudinal section of seed; 10, embryo:—*all but figs.* 4 *and* 5 *magnified.*

3. **Acacia diffusa** (Lindl. Bot. Reg. t. 632); frutex humilis diffusus glaber, ramulis angulatis, phyllodiis linearibus angustis rigidis crassis pungenti-mucronatis uninerviis aveniis sicco substriatis basi vix angustatis, pedunculis solitariis geminisve sphæricis monocephalis, capitulo multifloro, legumine longe lineari compresso.—*Benth. in Lond. Journ. Bot.* i. 337. A. prostrata, *Lodd. Bot. Cab.* 631. (*Gunn*, 131.)

Hab. Abundant in dry places, and especially by roadsides, throughout the Island.—(Fl. Oct. Dec.) (*v. v.*)

A small bush, rarely growing to more than 3 feet in height, but sometimes forming a diminutive tree.—*Branches* spreading, often prostrate, rigid, angled. *Phyllodia* $\frac{1}{2}$–2 inches long, linear, rigid, pungent, one-nerved, narrowed at the base. *Peduncles* generally two or three together, $\frac{1}{4}$–1 inch long, shorter than the phyllodia. *Capitula* spherical. *Flowers* very numerous. *Corolla* campanulate, trifid or quadrifid. *Pod* stalked, 2–5 inches long, narrow, linear, fuscous, with pale, thickened margins; valves coriaceous. *Seeds* numerous, linear-oblong, rounded at both ends; testa dark brown, opaque; *funiculus* with a large thickened strophiolus.

This very distinct and abundant species has not been found in Australia, though it is frequent in the islands of Bass' Straits; it is however very closely allied to the New South Wales and South-east Australian *A. cuspidata*, which differs chiefly in the narrower phyllodia.

4. **Acacia juniperina** (Willd. Sp. Pl. iv. 1049); fruticulus humilis, ramulis teretibus pubescentibus glabratisve, stipulis subulatis, phyllodiis lineari-subulatis rigidis glabris acuminato-pungentibus nervo prominente subtetragonis basi latiore sessilibus, pedunculis solitariis monocephalis phyllodiis sublongioribus, capitulis sphæricis, bracteolis acuminatis, sepalis subliberis, legumine (immaturo) lineari plano inter semina sæpius contracto.—*Benth. in Lond. Journ. Bot.* i. 339; *Vent. Malm. t.* 64; *Lodd. Bot. Cab.* 398. A. echinula, *DC. Prodr.* ii. 449. (*Gunn*, 1956.)

Hab. Near Georgetown and West Head, in light sandy land, *Gunn*.—(Fl. Sept.)

Distrib. New South Wales and South-eastern Australia.

A small diffuse shrub, growing in patches.—*Branches* terete, rather slender, pubescent or almost glabrous. *Phyllodia* $\frac{1}{3}$–$\frac{1}{2}$ inch long, rigid, linear-subulate with a pungent point, tetragonous, inserted by a broad base. *Peduncles* generally solitary, $\frac{1}{2}$ inch long. *Capitula* spherical, many-flowered. *Pod* (unripe only seen, and of Australian specimens) 1–3 inches long, more or less curved, linear, narrow, shortly stalked.

5. **Acacia ovoidea** (Benth. in Lond. Journ. Bot. i. 339); prostrata, glabra, ramulis gracilibus angulato-striatis, phyllodiis divaricatis hinc inde verticillatis lineari-subulatis rigidis acuminato-pungentibus nervo prominente subtetragonis basi non (aut vix ima basi) angustatis, pedunculis phyllodiis brevioribus

monocephalis, spicis ovoideis oblongisve dense multifloris, legumine lineari breviusculo. (*Gunn*, 676.) (Tab. XX.)

Hab. Amongst grass, etc., in dry soil, Woolnorth and Circular Head, *Gunn.*—(Fl. Sept. Oct.)

Distrib. South-eastern Australia.

A small, low, straggling, prostrate or procumbent bush, with slender, diffuse branches. *Stipules* subulate, deciduous. *Phyllodia* often whorled six together, linear-subulate, very acuminate, pungent, tetragonous, inserted by a broad base. *Peduncles* solitary or two together. *Spikes* ovoid or oblong, $\frac{1}{4}$–$\frac{1}{2}$ inch long. *Flowers* pale. *Bracts* stipitate, concave, spathulate, acuminate, villous at the back. *Sepals* oblong-lanceolate, united at the very base; margin coarsely ciliate. *Stamens* very numerous. *Ovary* villous. *Pods* about 1 inch long, dark brown, with a pale thickened margin, blunt or acute, compressed; valves rather membranous. *Seeds* few, distant, narrow oblong, red-brown, with a very long, much-thickened, flexuose funiculus.—Plate XX. Fig. 1, leaves and capitulum; 2, bract; 3, flower; 4, anther; 5, pollen; 6, ovary; 7, hair from ovary; 8, vertical section of ovary; 9, pod, with valve removed; 10, 11, 12, seeds; 13, 14, embryo; 15, embryo, with one cotyledon removed:—*all magnified.*

6. **Acacia verticillata** (Willd. Sp. Pl. iv. 1049); frutex erectus v. arbuscula, glabra pubescens v. tomentosa, ramulis angulato-striatis, phyllodiis divaricatis verticillatis lineari-subulatis lanceolatis oblongisve rigidis mucronato-pungentibus 1- (rarius 3-) nerviis, spicis cylindricis densifloris phyllodia superantibus, bracteolis acuminatis, legumine lineari subfalcato compresso.—*Benth. in Lond. Journ. Bot.* i. 340; *Vent. Malm. t.* 63; *Bot. Mag.* 110; *Lodd. Bot. Cab.* 535. (*Gunn*, 204, 401.)

Var. *β. latifolia*, DC. Prodr. ii. 454; phyllodiis latioribus submembranaceis.—A. ruscifolia, *A. Cunn. in Don Gard. Dict.* ii. 407; *Bot. Mag.* 3174; *Benth. l. c.* A. mœsta, *Lindl. Bot. Reg.* 1846. *t.* 67.

Hab. Abundant in moist situations throughout the Island. Var. *β.* Macquarrie Harbour, *A. Cunningham.*—(Fl. Oct. Dec.) (*v. v.*)

Distrib. South-eastern Australia.

A large shrub or small tree, 8–15 feet high, with spreading branches, and pubescent or tomentose angled and striate branchlets. *Phyllodia* $\frac{1}{3}$–$\frac{2}{3}$ inch long, generally whorled in six, linear-subulate, acuminate, pungent, sometimes expanded and becoming oblong-subfalcate, one- rarely three-nerved. *Peduncles* longer or shorter than the phyllodia, bearing cylindrical dense-flowered spikes, $\frac{1}{3}$–1 inch long, bright yellow. *Calyx* downy, deeply five-cleft. *Pod* $\frac{3}{4}$–3 inches long, generally curved, $\frac{1}{4}$–$\frac{1}{2}$ inch broad, narrow at both ends, with a pale thickened margin. *Valves* membranous. *Seeds* as in *A. ovoidea.*

7. **Acacia Riceana** (Henslow in the Botanist, iii. 135); arbuscula glaberrima, ramulis pendulis angulatis gracilibus apicibus tomentosis, phyllodiis anguste linearibus lineari-subulatisve sparsis subverticillatisve acuminato-pungentibus uninerviis, pedunculis elongatis gracilibus dissitifloris phyllodia superantibus, bracteolis brevibus, calyce brevissimo 3-lobo, floribus majusculis, leguminibus gracilibus linearibus valde curvis, petalis persistentibus suffultis.—*Benth. in Lond. Journ. Bot.* i. 340; *Paxt. Fl. Gard.* ii. 42, *cum ic. xyl.* A. setigera, *Hook. Ic. Pl. t.* 318. (*Gunn*, 482, 1063.)

Hab. Southern parts of the Island, in moist shady places on the banks of the Derwent, etc., *Gunn.* (Fl. Oct. Nov.) (*v. v.*)

A very handsome dark green small tree, 10–20 feet high, with copious pendulous slender branches, which are villous at the apices only. *Phyllodia* scattered or whorled, appressed, very narrow, 1–2 inches long, linear, acuminate, pungent, less rigid than in its congeners of this section, one-nerved. *Stipules* minute, broadly ovate, membranous. *Peduncles* slender, divaricating, longer than the phyllodia. *Flowers* large for the genus, solitary or aggregated by two or three together along the peduncle. *Bracts* small, appressed to the base of the flower, ciliate. *Calyx* very minute, cup-shaped, three-lobed; *lobes* ciliate. *Petals* generally three, persistent, glabrous. *Pods* 2–3

inches long, narrow, much curved, shortly stalked, retaining at their bases the persistent petals. *Seeds* as in *A. oxycedrus* and *ovoidea*.

8. **Acacia axillaris** (Benth. in Lond. Journ. Bot. i. 341); glabra v. ramulis puberulis subteretibus, phyllodiis anguste linearibus ut in *A. Riceana*, pedunculis brevibus phyllodiis multo longioribus, floribus subaggregatis, calyce brevissimo 3–4-lobo. (*Gunn*, 132 *in part.*)

Hab. Southern parts of the Island?, *Gunn, Stuart.*

I have seen only one small specimen of this from Gunn, with no habitat assigned, and another communicated by Dr. Müller, and collected by Mr. C. Stuart: of these, both differ remarkably from *A. Riceana* in the very short peduncle; and Gunn's specimen in the rigid, recurved phyllodia, with longer, pungent points; the habit and phyllodia of Stuart's specimen entirely accord with those of *A. Riceana*.

§ 3. Uninerviæ (Benth.).—*Stems not winged. Stipules obsolete. Phyllodia one- rarely two-nerved, ovate-oblong, linear or lanceolate, penniveined, blunt or mucronate, not pungent. Flowers capitate. Peduncles simple or branched.*

9. **Acacia myrtifolia** (Willd. Sp. Pl. iv. 1054); fruticulus glaberrimus, phyllodiis oblique oblongis lanceolatis v. oblongo- v. obovato-lanceolatis subfalcatis calloso-mucronatis crasse coriaceis marginatis, racemis strictis phyllodiis brevioribus v. ramis longioribus, ovario glabro v. puberulo, leguminibus erectis linearibus crasse marginatis.—*Benth. in Lond. Journ. Bot.* i. 349; *Sweet, Flor. Aust. t.* 49; *Lod. Bot. Cab.* 772. (*Gunn*, 203.)

Hab. Abundant in dry soil throughout the Colony.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. New South Wales and South-east Australia.

A small shrub, seldom exceeding two feet high, with ascending or erect branches everywhere perfectly glabrous, upper branches compressed or winged. *Phyllodia* 1–2 inches long, flat, coriaceous, lanceolate or oblong or obovate-lanceolate or elliptical, acute at both ends, narrowed into a short stipes; margins thick, often red; *costa* prominent, oblique, produced into a short blunt mucro; *nerves* few, diverging. *Peduncles* stout, red, erect, generally shorter than the phyllodia. *Capitula* few-flowered, on short stout diverging pedicels. *Calyx* very short, cup-shaped, three- or four-lobed, glabrous. *Petals* very coriaceous, glabrous. *Pods* 1–1½ inch long, erect, glabrous, coriaceous, narrow-linear, with very thick margins, sometimes a little twisted.

This appears to be also a native of South-west Australia, resembling very closely the *A. marginata*, Br., and *A. celastrifolia*, Benth., of that country; and if so, it is the only species of Tasmania, or indeed of any part of East Australia, that is also common to the west coast.

10. **Acacia suaveolens** (Willd. Sp. Pl. iv. 1050); frutex parce ramosus glaberrimus, ramulis late compressis triquetris, phyllodiis longe linearibus sublanceolatisve obtusis mucronulatis basi longe angustatis crassiusculis marginatis uninerviis prope basin minute glanduliferis, pedunculis brevibus racemosis juioribus squamatis, capitulis 6–10-floris, sepalis parvis anguste linearibus apice ciliatis, petalis multo minoribus, ovario glabro, legumine late oblongo.—*Benth. in Lond. Journ. Bot.* i. 350; *Smith, in Linn. Trans.* i. 253; *Lab. Nov. Holl.* ii. *t.* 236; *Lodd. Bot. Cab. t.* 730. (*Gunn*, 372.)

Hab. In dry soil near Georgetown, Circular Head, and islands of Bass' Straits; Derwent, opposite Hobarton, *Gunn, etc.*—(Fl. July, Aug.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia.

A shrub 3–6 feet high, with generally few small branches, everywhere quite glabrous. *Branches* erect, angled, compressed and somewhat winged. *Phyllodia* 2–5 inches long, ¼–⅓ inch broad, coriaceous, long, linear or linear-lanceolate, gradually tapering from above the middle to the base, straight or slightly falcate, with a cuspidate point; *costa* prominent; *veins* oblique, very indistinct. *Young flower-buds* covered with broad, concave, imbricating, striate,

coriaceous, deciduous bracts. *Peduncles* erect, shorter than the phyllodia. *Capitula* pedicelled, six- to ten-flowered. *Sepals* minute, free, linear, ciliate at their blunt apices. *Petals* membranous. *Pods* pedicelled, 1–2 inches long, $\frac{3}{4}$ inch broad, with a slender thickened margin, rather tortuous, blunt at both ends, glaucous, transversely septate; *valves* torulose, coriaceous. *Seeds* $\frac{1}{4}$ inch long, small for the size of the pod, compressed, linear-oblong, at right angles to the valve; *funiculus* much thickened; *testa* red-brown.—This is the earliest-flowering species of the genus.

11. **Acacia crassiuscula** (Wendl. Diss. 31. t. 8); frutex glaberrimus, ramulis gracilibus acute angulatis, phyllodiis longe linearibus sublanceolatisve mucronatis basi longe angustatis crassiusculis marginatis uninerviis, racemis phyllodio brevioribus, capitulis sub-20-floris, sepalis late obcuneatis apice truncatis puberulis connatis v. demum solutis corolla paullo brevioribus, legumine lineari.—*Benth. in Lond. Journ. Bot.* i. 356. (*Gunn*, 1957.)

Hab. Flinders' Island, Bass' Straits, *Milligan.*—(Fl. Feb., March.)

Distrib. New South Wales and South-eastern Australia.

Very similar indeed in foliage, habit, and general appearance to *A. suaveolens*, but a very different species; the branchlets being much more slender, acutely angled, and hardly compressed; the scales of the raceme, if ever present, are much more deciduous; the sepals are very broad, obcuneate and connate, till the flower is very old, when they only partially separate; and the pod is long, slender, and linear.

12. **Acacia verniciflua** (A. Cunn. in Field. N. S. Wales, 344); frutex v. arbuscula glaberrima, ramulis sulcatis angulatis, phyllodiis viscosis lineari- v. oblongo-lanceolatis utrinque angustatis acutis calloso-mucronatis rectis falcatisve binerviis (rarius uninerviis) venis obscuris, pedunculis brevibus monocephalis, capitulis multifloris, legumine anguste lineari elongato planiusculo glabro marginato, valvis coriaceis, seminibus lineari-oblongis compressis.—*Benth. in Lond. Journ. Bot.* i. 361; *Hook. Bot. Mag. t.* 3266. A. graveolens, *A. Cunn. in Don Gard. Dict.* ii. 404; *Lodd. Bot. Cab. t.* 1460; *Bot. Mag. t.* 3279. A. virgata, *Lodd. Bot. Cab. t.* 1246. (*Gunn*, 479.)

Hab. Common in many parts of the Island, especially about Hobarton; also at St. Patrick's River, Launceston, and near Yorktown, *Gunn.*—(Fl. Sept.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A large shrub or small tree 10–20 feet high, forming thickets in many places, remarkable for the abundance of viscid matter exuded by the leaves and young branches. Everywhere quite glabrous.—*Branchlets* slender, angled. *Phyllodia* narrow, linear-oblong or oblong-lanceolate, 2–3 inches long, $\frac{1}{2}$ inch broad, acute, narrowed at both ends, two-nerved, one of them oblique, rarely one-nerved. *Capitula* solitary, on short axillary peduncles, many-flowered. *Calyx* broadly campanulate, pubescent, five-toothed; teeth blunt. *Petals* twice as long as the calyx. *Ovary* pubescent. *Pods* linear, as long as the phyllodia, but much narrower, somewhat undulate; *valves* coriaceous. *Seeds* with a dark brown shining testa, linear-oblong, parallel to the pod.

13. **Acacia stricta** (Willd. Sp. Pl. iv. 1052); frutex glaberrimus subresinosus, ramulis angulatis, phyllodiis longe et late linearibus lineari-oblongis lanceolatisve basi longe angustatis apice obtusis glanduliferis v. obscure mucronatis retusisve uninerviis (rarius nervo altero laterali) penniveniis, pedunculis brevibus axillaribus monocephalis, capitulis multifloris, legumine anguste lineari marginato, valvis subtorulosis, seminibus lineari-oblongis compressis.—*Benth. in Lond. Journ. Bot.* i. 362; *Andr. Bot. Rep. t.* 53; *Hook. Bot. Mag. t.* 1121; *Lodd. Bot. Cab. t.* 99. A. emarginata, *Wendl. Diss.* 27. (*Gunn*, 205, 478, 801.)

Hab. Common throughout the Colony in dry soil, *Gunn, etc.*—(Fl. Sept. Oct.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A shrub 2–3 feet high, with creeping roots, forming large patches, variable in habit and foliage; quite

glabrous, and rather viscous at times. *Branches* angled. *Phyllodia* 2–4 inches long, about ½ inch broad, narrow linear-lanceolate or oblong, narrowed below from above the middle: point blunt, mucronate or retuse, often obliquely notched, one-nerved, or with a second lateral nerve, and many distinct oblique veins. *Capitula* many-flowered, on short, stout axillary peduncles. *Calyx*, *corolla*, and *ovary* quite similar to those of *A. verniciflua*. *Pods* linear, very slender, with rather membranous valves, and small, oblong, compressed seeds, parallel to the pod, and covered with a red-brown testa, smaller than those of *A. verniciflua*.—This plant is easily distinguished from *A. verniciflua* by the one-nerved phyllodia and very distinct close-set fine veins, also by the much smaller pod, with more membranous valves and smaller seeds. Gunn remarks that it seldom fruits.

§ 4. Brachybotryæ, Benth.—*Stems not winged. Stipules obsolete. Phyllodia three- or many-nerved, reticulated with parallel veins, not pungent, linear-elongated. Peduncles simple or racemose.*

14. **Acacia melanoxylon** (Br. Hort. Kew. ed. 2, iii. 462); arbor glaberrima, ramulis angulatis, phyllodiis falcato-oblongis sublanceolatisve retusis obtusis acutisve basi longe angustatis coriaceis multinerviis crebre venulosis, racemis brevibus 1–4-cephalis, capitulis dense multifloris, legumine lato-lineari plano arcuato glabro marginibus incrassatis, seminibus oblongis funiculo bis replicato circumdatis.—*Benth. in Lond. Journ. Bot.* i. 367; *Wend. Diss. t.* 6; *Bot. Mag. t.* 1659; *Lodd. Bot. Cab. t.* 630. A. arcuata, *Sieb. Pl. N. H.* 459. (*Gunn*, 201, 201?)

Hab. Abundant throughout the Island, in various localities, *Gunn, etc.*—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales and South-eastern Australia. (Cultivated in England.)

A tree, rarely forming a bush, or flowering when young and before it has become a full-sized tree.—*Branches* rather stout, covered with brown bark; twigs slender, angled. *Phyllodia* 2–5 inches long, falcate, narrow oblong or oblong-lanceolate or elliptical-lanceolate, blunt, short or retuse, coriaceous, many-nerved, with slender, fine, reticulated veins. *Peduncles* axillary, short, stout, branched sparingly. *Flowers* in spherical capitula, numerous. *Calyx* broadly campanulate, truncate, obtusely five-toothed. *Sepals* connate, obovate-cuneate, with truncate thickened pubescent apices, one-third shorter than the corolla. *Pods* linear, elongated, curved, 2 inches long, ⅓ broad, with a thick margin, glaucous; *valves* coriaceous. *Seeds* small, oblong, parallel to the pod; *testa* jet-black, shining; *funiculus* forming serpentine coils that completely encircle the seed, first passing from the placenta to the apex of the seed, then reflected to the placenta, and passing up the opposite side, being again reflected to its point of insertion to the seed; thus forming a double rim on either side of the seed: and it is of a pale red colour.

§ 5. Juliferæ, Benth.—*Stems not winged. Stipules obsolete. Phyllodia narrow, many-* (*in* A. linearis *sometimes one-*) *nerved; veins parallel, rarely reticulate. Inflorescence spicate.*

15. **Acacia linearis** (Sims, Bot. Mag. t. 2156); frutex gracilis glaberrimus, ramis angulatis junioribus puberulis, phyllodiis longe et anguste linearibus muticis v. vix mucronatis 1–3-nerviis nervo medio prominente lateralibus obscuris basi longe angustatis, spicis gracilibus interruptis phyllodio multo brevioribus glabris, legumine anguste lineari intus continuo.—*Benth. in Lond. Journ. Bot.* i. 371; *Lodd. Bot. Cab. t.* 595. H. longissima, *Wendl. Diss. t.* 11; *Bot. Reg. t.* 680. (*Gunn*, 677.)

Hab. Circular Head, in one spot only, *Gunn.*—(Fl. Nov.)

Distrib. New South Wales. (Cultivated in England.)

This appears to be a very rare Tasmanian plant, and has never been found in fruit. Mr. Gunn, who alone has gathered it, says that he has seen a very few bushes of it, which have since been burnt down: and as the place where they grew has been fenced in, and turned to a pasturage, it is probable that it will become extinct there.—A small bush, 3–5 feet high, with slender inclined stem, and long, very narrow phyllodia, which are pendulous or point in various directions. Young *branches* angled, glabrous, slender. *Phyllodia* 4–8 inches long, not ¼ inch broad, coria-

ceous, blunt, retuse, or acute, with one prominent nerve and lateral slender ones. *Spikes* 1–3 inches long. *Sepals* minute, broadly ovate, coriaceous, concave. *Petals* coriaceous, recurved, connate at the base. *Pod* narrow linear in Australian specimens.

16. **Acacia mucronata** (Willd. Enum. Suppl. 68); frutex v. arbuscula glaberrima, ramulis subangulatis junioribus puberulis, phyllodiis anguste et longe linearibus lineari-spathulatis oblongisve 3-multinerviis obtusis v. mucronulatis basi longe angustatis, spicis interruptis phyllodio brevioribus, legumine anguste lineari subtereti.

Var. *α*; phyllodiis anguste lincari-spathulatis obtusis sub-3-nerviis.—A. mucronata, *Wendl. Diss. t.* 12; *Bot. Mag. t.* 2747; *Benth. in Lond. Journ. Bot.* i. 372. (*Gunn*, 130.)

Var. *β. dependens;* phyllodiis ut in *α*, sed latioribus et multinerviis.—A. dependens, *A. Cunn. MS.; Benth. l. c.* (*Gunn*, 202, 480, 678.)

Var. *γ. dissitiflora;* phyllodiis longe lineari-lanceolatis basi 3–5-nerviis.—A. dissitiflora, *Benth. l. c.* (*Gunn*, 130 *in part. et* 802.)

Hab. Common in various places throughout the Island, ascending to 2–3000 feet, *Cunningham, Gunn, etc.*—(Fl. Nov.) (*v. v.*).

Distrib. South-eastern Australia. (Cultivated in England.)

A stout ramous shrub, 5–15 feet high; everywhere, except on the youngest parts, glabrous. *Branchlets* angled, but less so than in most species. *Phyllodia* 2–7 inches long, narrow linear, oblong-lanceolate, or spathulate, narrowed from below the middle to the base, coriaceous, three- to many-nerved, with obscure transverse veins. *Spikes* interrupted, shorter than the phyllodia, simple; *flowers* solitary, or few together and distant. *Calyx* broadly cup-shaped, very broad, obscurely lobed, pubescent. *Corolla* rather coriaceous; petals recurved, united at the base. *Ovary* villous. *Pod* very long, narrow linear, straight, subterete, pointed at both ends, 3–6 inches long, edges rather waved, margins thickened; valves hardly coriaceous. *Seeds* distant, narrow linear-oblong, parallel with the pod, and occupying its whole breadth, pale brown: (shorter pods appear to have shorter and broader seeds.) *Caruncula* very much thickened.—Mr. Bentham has united the above varieties under *mucronata;* they are connected by many intermediate forms.

17. **Acacia Sophoræ** (Br. Hort. Kew. ed. 3. v. 462); frutex v. arbuscula, ramis robustis decumbentibus apice ramulisque erectis angulatis, phyllodiis obovato-oblongis obtusis calloso-mucronatis basi anguste cuneatis coriaceis 3–5-nerviis reticulatim venosis, spicis interruptis phyllodiis brevioribus, legumine anguste lineari subtereti toruloso arcuato.—*Benth. in Lond. Journ. Bot.* i. 372; *Lab. Nov. Holl. t.* 237; *Lodd. Bot. Cab. t.* 1351. (*Gunn*, 675.)

Hab. Abundant generally on sand-hills by the sea, *Labillardière, etc.*—(Fl. Sept., Oct.) (*v. v.*)

Distrib. New South Wales? and South-eastern Australia. (Cultivated in England.)

A glabrous, stout, branching small shrub or tree, with decumbent or prostrate trunk and main branches from which the branches ascend and are sometimes 10 feet high. *Phyllodia* $1\frac{1}{2}$–4 inches long, $\frac{3}{4}$ inch broad, coriaceous, oblong-lanceolate or narrow ovate-oblong, blunt with an obtuse mucro, five- or many-nerved and reticulated, often shining, with many small anastomosing veins and veinlets. *Spikes* shorter than the phyllodia, stout, simple, cylindrical; *flowers* crowded; *calyx* and *corolla* as in *A. mucronata*. *Pods* 3–6 inches long, narrow, linear terete, much curved, with long points; *valves* concave, torulose. *Seeds* broadly linear-oblong, with a pale-brown shining testa and large swollen caruncula.—This appears to be also a New South Wales plant, and may be identical with the *A. longifolia*, Willd.; but most states of that from the Blue Mountains have very long phyllodia, whilst others, supposed to be the same species, from Moreton Bay, have much more slender pods than *A. Sophoræ*. There are however in Herb. Hook. some specimens from the southward of Port Jackson that agree so closely in foliage and flower with the Tasmanian one, that it is probable they are the same.

SERIES II. *BOTRYOCEPHALÆ*, Benth.—*Leaves bipinnate in the full-grown plant. Inflorescence capitate.*

18. **Acacia discolor** (Willd. Sp. Pl. iv. 1068); frutex, ramulis angulatis tetragonis sub-4-alatisve petiolisque pubescentibus glaberrimisve, pinnis 2–6-jugis, glandula petiolari scutellæformi magna, foliolis 10–15-jugis oblongis lineari-oblongis oblongo-lanceolatisve obtusis mucronatisve uninerviis subtus pallidis, capitulorum racemis folio brevioribus, floribus puberulis, calyce brevi ciliato petalis multoties breviore, ovario glaberrimo, legumine lato lineari compressissimo recto glabro, seminibus late oblongis valde compressis.

Var. β. *maritima* (Benth.); glaberrima, pinnis 2–4-jugis.—A. maritima, *Benth. in Lond. Journ. Bot.* i. 384. (*Gunn*, 373.)

HAB. Var. β. Common near the sea-coast in various localities, *Cunningham, Gunn, etc.*—(Fl. May, July.) (*v. v.*)

DISTRIB. New South Wales and South-eastern Australia.

A shrub 3–5 feet high, with rather spreading branches, glabrous in every part. *Branches* generally sharply four-angled or with four thickened wings. *Pinnæ* three to five pairs, angled, 2–4 inches long; *petioles* with a large oblong depressed gland; *pinnules* ten to fifteen pairs, linear or oblong-linear, acuminate, coriaceous, pale below, ⅓–½ inch long. *Capitula* in spreading panicles. *Pods* 2½–3½ inches long, ⅓ inch broad, stipitate, linear, blunt, much compressed, red-brown, margined; *valves* flat, coriaceous. *Seeds* broadly ovoid-oblong, much compressed; *funiculus* doubled on itself, rather swollen.—The northern New South Wales specimens of *A. discolor* have pubescent branches and petioles and panicles; the pods are rather shorter, and the valves rather thicker, and these are often tuberculated over the position of the seeds.

19. **Acacia dealbata** (Link, En. Hort. Berol. 455); arborea, tota albido-cinerea et glauca, ramulis angulatis foliisque junioribus argenteis petiolisque velutino-pubescentibus, pinnis 8–20-jugis, glandulis verrucæformibus ad omnia paria pinnarum, foliolis 30–40-jugis confertis parvis linearibus obtusis pubescentibus, capitulorum racemis paniculatis, floribus glabriusculis, calyce corolla dimidio breviore, legumine lato-lineari compressissimo marginibus vix undulatis subincrassatis, valvis membranaceis glaucis. —*Benth. in Lond. Journ. Bot.* i. 385. (*Gunn*, 476.)

HAB. Abundant in all parts of the Island.—(Fl. Aug., Sept.) (*v. v.*) (Colonial name, "Silver Wattle.")

DISTRIB. New South Wales and South-east Australia.

A most beautiful plant, very variable in stature and habit, sometimes forming a small bush branching from the base, at others a lofty tree (100 feet high in deep dark forests), with a slender graceful trunk and small crown. Bark exported for tanning purposes, under the name of "Mimosa Bark."—*Branches* angled, and, as well as the petioles, panicles, and pinnules, glaucous, and covered more or less with a silvery-white pubescence; the young branches and leaves very white and silvery. *Pinnæ* in eight to ten pairs; *petioles* with warts between every pair of pinnules. *Leaflets* very numerous, crowded, thirty to forty pairs, linear, blunt, coriaceous, ¼ inch long. *Panicles* axillary, shorter than the leaves. *Pods* 2–3 inches long, linear, very much compressed, stipitate, acuminate, edges straight, except where the seeds do not ripen; margins slightly thickened; *valves* glaucous, flat. *Seeds* not one-fourth the breadth of the pod, oblong, much compressed, with a rather slender long funiculus.

20. **Acacia mollissima** (Willd. Enum. 1053); ramulis angulatis, petiolis paniculis pinnulisque velutino-pubescentibus cano-cinereisve junioribus aureis, foliis et inflorescentia ut in *A. dealbata*, legumine puberulo lineari toruloso marginibus incrassatis inter semina constrictis.—*Benth. in Lond. Journ. Bot.* i. 385; *Sweet, Fl. Austral. t.* 12. A. decurrens, *var.* mollissima, *Lindl. Bot. Reg. t.* 371. (*Gunn*, 477.)

HAB. Abundant throughout the Islands.—(Fl. Nov., Dec.) (*v. v.*) (Colonial name, "Black or Green Wattle.")

DISTRIB. New South Wales and South-eastern Australia. (Cultivated in England.)

Very similar indeed to the *A. dealbata*, and probably only a state of that plant, though looking very different when seen beside it. The present never forms so large a tree as *A. dealbata*, is of a dark lurid hue, has golden-yellow young shoots, and the pod is narrower, more torulose, more or less pubescent, with thicker margins, more coriaceous valves, constricted between the seeds, so that the pod is moniliform, and it has larger seeds.

For many valuable remarks on the Tasmanian *Acaciæ*, see an article by Mr. Gunn in the second volume of the 'Tasmanian Journal of Natural Science.'

Nat. Ord. XXVII. ROSACEÆ.

Of all the large natural families of flowering plants that are widely diffused over the globe, this is one of the most scantily represented in Australia. Including the subfamily *Chrysobalaneæ* (which presents one species of *Petrocarya* in the Tropics and two of *Stylobasium* in the south-west coast), scarcely a dozen species have hitherto been found in the whole continent, and they belong to six genera, of which four, *Geum*, *Potentilla*, *Rubus*, and *Alchemilla*, are cosmopolitan; a fifth, *Acæna*, is almost confined to the Southern Hemisphere, and *Cephalotus* (the Australian "Pitcher-plant") is peculiar to the neighbourhood of King George's Sound, in South-western Australia. It is remarkable that both the species of *Alchemilla* are English, one the *A. arvensis*, originally detected by Mr. Brown, and the other *A. vulgaris*, found, according to Dr. Mueller, on the Alps of South-eastern Australia.

Gen. I. RUBUS, *L.*

Calyx explanatus, ebracteolatus, persistens, 5-lobus. *Petala* 5–7, calyce inserta. *Stamina* numerosa. *Ovaria* receptaculo inserta, 1-ovulata. *Drupæ* succosæ, receptaculo subcarnoso v. spongioso insertæ.

Only five or six species of this cosmopolitan genus are found in Australia, of which three are tropical species and also Indian; one is confined to New South Wales, and one, *R. Gunnianus*, is only found in Tasmania.—Subscandent or suberect shrubs, rarely creeping herbs, often prickly, with alternate, simple, lobed, ternate, digitate or imparipinnate leaves, adnate stipules, panicled or corymbose, rarely solitary, flowers. *Calyx* without bracts, with five spreading lobes. *Petals* five. *Stamens* numerous. *Ovaries* numerous, rarely (in *R. Gunnianus*) definite in number. *Fruit* formed of small, cohering, fleshy drupes, attached to the dry or spongy receptacle. (Name of uncertain origin.)

1. **Rubus macropodus** (Seringe in DC. Prodr. ii. 557); aculeatus, suberectus, ramulis pedunculis petiolis calycibus foliisque subtus cano-tomentosis, foliis pinnatisectis, foliolis 2–3-jugis rhombeo-ovatis obovatisve supra pilosis duplicato-crenatis terminali margine integro v. lobato, floribus axillaribus terminalibusque, pedunculis unifloris v. paniculatim ramosis, lobis calycinis lanceolatis acuminatis petalis rubris longioribus.—R. ribesifolius, *Sieb. Pl. Exsicc. No.* 192. (*Gunn*, 33.)

Hab. Very common in many parts of the Colony.—(Fl. Dec., Jan.; fr. Feb.)

Distrib. East coast of Australia, from Stradbrooke Island to Melbourne.

A small, slender, prickly shrub, with tomentose branches, peduncles, petioles, and calyx, and which has snow-white under-surfaces of the leaves.—*Leaves* 2–4 inches long, pinnate, with one or two pairs of leaflets, which are rather coriaceous, wrinkled, hairy above, ovate, obovate, or rhomboid, entire or lobed, rather sharply doubly or trebly crenate, blunt or acute; the terminal larger, and more usually lobed. *Pedicels* slender, generally long, axillary, one- or more flowered, or terminal and forming many-flowered panicles. *Flowers* $\frac{1}{2}$–$\frac{3}{4}$ inch across. *Calyx* woolly, its lobes lanceolate-acuminate, longer than the red petals. *Stamens* as long as the petals. *Fruit* not very large, according to Gunn, but of a pleasant flavour.

2. **Rubus Gunnianus** (Hook. Ic. Plant. t. 291); inermis, repens, glaberrimus, foliis simplicibus

v. lobatis v. ternatim v. pinnatim trifoliolatis, foliolis ovatis obovatisve duplicato-crenatis integris v. varie lobatis, pedunculis subterminalibus solitariis 1-floris, calycis lobis ovatis subacutis pilosis petalis flavis brevioribus, ovariis 5. (*Gunn*, 271.)

Hab. Common on the mountains at 3000–5000 feet elevation, *Gunn*.—(Fl. Oct.; fr. Feb.) (*v. v.*)

A very remarkable little species, especially from having a definite number of ovaries, and, according to Mr. Gunn, yellow flowers.—A small, creeping, tufted, glabrous plant, forming patches on peaty soil several feet in diameter. *Stems* much branched, slender, flexuose, usually buried in the soil. *Petioles* slender, $\frac{1}{4}$–2 inches long, bearing one or more simple or lobed doubly-crenate leaflets, that are extremely variable in shape. *Leaflets* coriaceous, ternate or pinnate, the upper ovate, deltoid, or oblong, simple or lobed; lateral small, irregular in outline. *Peduncles* solitary, short, simple, one-flowered. *Flowers* often nestled amongst the leaves, about $\frac{1}{3}$ inch across, yellow. *Drupes* very fleshy, scarlet; *endocarp* rugose. *Fruit* as large as that of *R. saxatilis*, hidden amongst the leaves; its flavour excellent, similar to that of the cranberry.

Gen. II. POTENTILLA, *L.*

Calyx explanatus, 4–5-bracteolatus. *Petala* 5, calyce inserta. *Stamina* numerosa. *Ovaria* receptaculo inserta, 1-ovulata. *Achenia* sicca, receptaculo sicco piloso inserta, stylo brevi laterali.

The only Australian species of this extensive European and North American genus is a native of very many parts of the globe, and is the common Silver-weed of England. The genus differs from *Rubus* in its almost invariably herbaceous habit, the bracteolate calyx, and in the dry achenia which form the fruit. (Name from *potens*, powerful; in allusion to the reputed virtues of some species.)

1. **Potentilla anserina** (Linn. Sp. Pl. 710); glabrata v. sericeo-villosa, caule radicante stolonifero, foliis abrupte pinnatisectis, pinnis multijugis ovatis rotundatis oblongisve argute serratis subtus sericeis, pedunculis gracilibus villosis elongatis 1-floris, petalis aureis.—*De Cand. Prodr.* ii. 582; *Engl. Bot. t.* 681; *Fl. Ant.* ii. 262. (*Gunn*, 251.)

Hab. Circular Head and elsewhere on the north and west coasts; rarer to the southward of the Colony, *Gunn*.—(Fl. Nov. to Jan.) (*v. v.*)

Distrib. South-east Australia, New Zealand, western extratropical South America, and throughout the temperate and colder zones of Europe, Asia, and America.

A very beautiful plant, extremely variable in size and amount of hairiness, being almost glabrous or densely silky, with silvery, shaggy hairs.—*Stems* stout or slender, sending out long rooting stolons; leaf-bearing branches very short. *Leaves* in tufts, 2–8 inches long, unequally pinnate; *leaflets* six to twenty pairs, oblong-obovate or rounded, the alternate pairs often minute, deeply acutely crenate or cut. *Peduncles* solitary, erect, generally longer than the leaves, one-flowered. *Flowers* large, golden yellow, very variable in size.

Gen. III. GEUM, *L.*

Calyx 5-lobus, 5-bracteolatus. *Petala* 5. *Stamina* numerosa. *Achenia* sicca, in capitulum receptaculo sicco disposita; stylo elongato rigido persistente post anthesin elongato articulato geniculato v. barbato.

A very puzzling genus, on account of the difficulty of determining what are species and what only varieties. I have several times examined the southern species, but never been able to satisfy myself regarding them, the common Tasmanian and New Zealand species especially appearing to be the same as the South American, and to be scarcely, if at all, different from states of the common *G. urbanum* of Europe and temperate Asia. The genus is readily distinguished by the globose or oblong head of achenia, terminating in rigid, persistent, awn-like styles, that have a sharp bend or articulation above the middle, or are plumose.

1. **Geum urbanum** (Linn. Sp. Pl. 716), var. *strictum;* pubescenti-pilosum v. villosum, caule erecto stricto dichotome-ramoso folioso multifloro, foliis radicalibus interrupte pinnatisectis, foliolis rhombeo-cuneiformibus inciso-lobatis duplicato-serratis terminali majore, pedunculis villosis, calycibus pubescenti-pilosis, petalis flavis, capitulo acheniorum oblongo v. globoso, acheniis compressis villosis, stylis deflexis apices versus geniculatis.—G. strictum, *Ait. Hort. Kew.* i. 207. G. Magellanicum, *Commerson, ex Pers. Ench.* ii. 57; *De Cand. Prodr.* ii. 554; *Fl. N. Zeal.* i. 55, ii. 327; *Fl. Ant.* ii. 262. G. ranunculoides, *Ser. in Mem. Soc. Phys. Gen.* ii. 138; *De Cand. Prodr.* i. 551. G. Australiæ, *Ferd. Mueller.* (*Gunn,* 249.)

Hab. Not uncommon in shady places in various parts of the Colony, *Gunn.*—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia (Victoria, *Mueller*), New Zealand, and South Chili and Fuegia, Canada and the Northern United States, temperate Europe and Asia.

In the Supplement to the 'New Zealand Flora,' ii. 328, I have alluded to Asa Gray's remarks on this plant, which he has published in the 'Botany of the United States' Exploring Expedition' (i. 501); he there observes that I should have adopted in the 'New Zealand Flora' the name of *strictum* in preference to that of *Magellanicum*, and this I should have done here, were it not that a full reconsideration of the subject confirms my original impression that it is the *G. urbanum* of Europe. I have quoted under the species only those synonyms of whose identification I am most sure: in the 'New Zealand Flora' I have added to the list *G. Chiloense, Chilense, Quellyon,* and *intermedium,* a re-union in which Asa Gray agrees. — The Tasmanian plant forms a rigid, strict, erect, branching, leafy, hairy, silky, or villous herb, 2–3 feet high, with many rather small yellow flowers. *Leaves* pinnatisect; *leaflets* two or four pair, extremely variable in size and shape, more or less lobed, cut, and inciso-serrate, those of the cauline leaves often lacerate. *Heads of achenia* globose or oblong, villous. *Styles* of the fruit deflexed, abruptly bent and twisted once towards the apex, which is nearly smooth: the portion of the style beyond the twist is often broken off when the style appears hooked at the apex.

Gen. IV. ACÆNA, *Vahl.*

Calycis tubus oblongus, compressus v. angulatus, angulis sæpissime in aristas simplices v. glochidiatas post anthesin excurrentibus; fauce constricta. *Petala* 2–5 v. 0, libera v. basi coalita, ore calycis inserta. *Stamina* 2–5. *Ovaria* 1–2, calyce inclusa, 1-ovulata; stylo terminali; stigmate plumoso. *Achenia* 1–2, calyce indurato tecta; pericarpio coriaceo v. membranaceo.

This very remarkable genus is almost exclusively confined to the temperate and colder regions of the Southern Hemisphere, a few species advancing in South America northwards along the Andes into the Tropics. The two Tasmanian species are both Australian, and none other have been detected in that continent. They are common in some pastures, where the hooked bristles of the calyces often cause great annoyance to sheep, whose wool becomes covered with "burrs," and is with difficulty freed from them.—*Herbs* with often woody rhizomes, very short branches, pinnated leaves, and terminal scapes; *inflorescence* usually capitate, rarely spiked. *Flowers* minute. *Calyx*-tube oblong, unarmed or covered with hooked bristles, often quadrangular, the angles, after flowering, elongating into sharp spines, that are in some species tipped with recurved bristles. *Petals* minute, four or five, or none. *Stamens* one to four. *Achenia* hidden in the tube of the calyx; the style and plumose *stigmata* exserted. (Named from *ακαινα, a spine;* in allusion to the spinous calyces.)

1. **Acæna Sanguisorbæ** (Vahl, Enum. i. 294); sericeo-pilosa v. glabrata, foliolis 4–10-jugis ovatis oblongis rotundatisve inciso-serratis, capitulis globosis, calycis tubo tetragono fructifero 4-aristato, aristis apice glochidiatis, petala basi cohærentia, staminibus 2, stigmate dilatato fimbriato.—*De Cand. Prodr.* ii. 592; *Fl. Ant.* i. 9; *Fl. N. Zeal.* i. 54. Ancistrum Sanguisorbæ, *Linn. fil. Suppl. p.* 189. A. diandrum, *Forst. Prodr. n.* 52. A. anserinæfolium, *Forst. Gen. t.* 2. A. decumbens, *Gærtn. Fruct. t.* 32. (*Gunn,* 483.)

Var. β. *montana;* minor, glabrata, petalis interdum liberis.—Acæna montana, *Nob. in Lond. Journ. Bot.* vi. 476. (*Gunn,* 1064.)

Hab. Common in pastures and roadsides, etc., throughout the Colony.—(Fl. Nov.) Var. β. Mount Wellington, elev. 3–4000 feet. (*v. v.*)

Distrib. South-east Australia, from Sydney to Victoria; New Zealand, Lord Auckland's Island.

Stems trailing, a span to 2 feet long. *Branches* erect or ascending. *Leaves* 2–6 inches long, silky or almost glabrous; *leaflets* four to ten pairs, obovate-oblong or rounded, obtuse, coarsely inciso-serrate, ¼–1 inch long. *Scapes* 4 inches to almost a foot long, often with one or two small leaves. *Heads* variable in size, globose, seldom more than ¾ inch diameter. *Calyx*-tube four-angled, with four rigid purple spines ½ inch long, barbed at the tips. *Petals* four. *Stamens* two. *Stigmas* dilated, fimbriated.—The natives of the Middle Island of New Zealand use a decoction of the leaves of this plant as a medicine.

2. **Acæna ovina** (A. Cunn. in Field's N. S. W.); sericeo-pilosa v. glabrata, foliolis oblongis ovatisve 4–10-jugis subpinnatifido-serratis incisisve obtusis, inflorescentia spicata (scapo interdum diviso), floribus subdioicis glomeratis, calycis tubo late oblongo villoso compresso spinis brevibus apice glochidiatis simplicibusve armato, petalis 4 inter se plus minusve cohærentibus, staminibus sub-6, floribus fœmineis ad coronam brevem reductis, carpellis 2, stigmate dilatato fimbriato.—*Benth. in Plant. Hügel. p.* 43; *Asa Gray, Bot. U. S. Expl. Exp.* i. 498. A. echinata, *Lehm. in Plant. Preiss.* i. 95. A. Behriana, *Schlecht. in Linnæa,* xx. 660. (*Gunn,* 87.)

Hab. Pastures, especially in the northern parts of the Colony, *Lawrence, Gunn.*—(Fl. Nov.)

Distrib. South-western and South-eastern Australia, from Sydney to Victoria.

A larger, taller plant than *A. Sanguisorbæ;* like it, extremely variable in stature, silkiness, and form of the leaflets, readily distinguished by the tall scapes and spiked inflorescence. *Flowers* spuriously dioecious, the females having no stamens, but in their place a very short lobed or toothed epigynous disc; the males with small calyces, imperfect *achenia*, and six stamens, collected into small clusters. *Calyx*-tube slightly compressed, silky or villous, armed with short, unequal, rigid spines, that are either simple or barbed at the apex. *Petals* green or purple, pubescent at the back, more or less cohering at the base. *Carpels* two, one in the female flowers with a simple, and the other with a dilated, stigma; only one ripens.—Except in having only six stamens (instead of ten), and four (not five) petals, this agrees so well with Schlechtendal's description of *A. Behriana*, that I should doubt the latter proving distinct. Mr. Gunn describes the hooked calyces of this species as being extremely troublesome, especially from their adhering to linen exposed to dry on the grass.

Nat. Ord. XXVIII. ONAGRARIÆ.

This Natural Order, the species of which abound in America, is comparatively poorly represented in Australia, except the *Haloragee* be included in it, with which this Order is linked by many osculant genera. Of the Australian genera, *Epilobium* is the largest, though the species are much less numerous than in New Zealand. Several species of *Jussieua* are found in the warmer parts of the continent, some even advancing as far south as Victoria; these are for the most part common tropical Asiatic and American weeds. The occurrence of a species of the otherwise wholly American genus *Œnothera* on the mountains of Tasmania, is a most curious fact in geographical distribution.

Gen. I. EPILOBIUM, *L.*

Calycis tubus elongatus, 4-gonus, ovario adnatus; limbus 4-sepalus, deciduus. *Petala* 4. *Stamina* 8.

Ovarium 4-loculare, stylo elongato, stigmate clavato. *Capsula* 4-gona, 4-locularis, loculicide 4-valvis, polysperma, valvis membranaceis. *Semina* ascendentia, ad chalazam apicalem longe comosa.

More or less pubescent or pilose, rarely glabrous, slender, erect herbs, with woody, perennial, erect or decumbent stems, or with often creeping rhizomes, opposite or alternate leaves, and axillary, rose-coloured or white flowers. *Calyx*-tube adnate with the very long, linear, tetragonous ovary, its limb four-cleft, deciduous. *Petals* four. *Stamens* eight. *Style* slender, with a clavate, simple or lobed stigma. *Capsule* four-celled, four-valved; dissepiments opposite the middle of the valves, with numerous seeds attached to the axis; *valves* separating from the four-winged axis.—*Seeds* with a crustaceous testa, and a long tuft of silky hairs at the chalaza. (Name from επι, *upon*, and λοβος, *a pod;* in allusion to the limb of the calyx surmounting the ovary.)

A very extensive European genus, abundant in most temperate climates, and especially so in New Zealand. Many of the species have very wide ranges, and are extremely difficult of determination; characters have been sought in all parts of the plants, but none appear very constant, except such as serve to distinguish some of the most prominent sections of the genus. Lately, specific marks have been supposed to exist in the microscopic nature of the pubescence of the winter leaf-shoots, but such characters can never be available for practical purposes, nor is their value susceptible of being accurately estimated, for these shoots vary extremely, according to the mildness and humidity of the season, and they are not (like the floral organs) highly developed parts of the plant. For my own part I must confess that I have no definite idea of what are species and what not, in the genus; after a most careful study of all the southern forms in a dried state, I am quite unable to pronounce any decided opinion upon any of them. In New Zealand, where the genus is more abundant than in any other part of the globe, and covers great tracts of country, I was quite unable to distinguish the species with any precision, though I studied them most carefully in the live state, and at all periods of growth. In Britain too I have paid some attention to the native forms, both wild and cultivated, with no better success. In all cases it is very easy to recognize certain forms as more constant than others, but the idea that is conceived of a species in the wild state, in so variable a genus, is modified extremely by, and perhaps wholly depends upon, the character it assumes in the locality wherein it is most examined; just as our ideas of a species, when drawn from the collections of others, are founded upon the majority of the specimens they send. In the 'Flora Antarctica' I have stated that there are in Tasmania plants exactly resembling the European *E. alpinum;* I have not however included that species in the Tasmanian flora, as I believe the specimens alluded to are only small states of *E. glabellum*, wholly undistinguishable however from *E. alpinum*. In the present unsatisfactory state of our systematic knowledge of the genus it is unsafe to speculate upon the significance of such a fact as this; it is but one of a great class which will, in my opinion, when properly worked out and made as prominent as they should be, lead to a very different and much more satisfactory view of specific botany than what is usually entertained.

In the descriptions of the species here given, the characters are all relative only, and not absolute. In no species are the leaves always and uniformly opposite, or always glabrous or hairy, and so on; it is almost hopeless for any one who has not all or the majority of the Tasmanian species to compare together, to make out an isolated specimen by the descriptions. The characters differ a little from those given to the same species in the New Zealand Flora, as I have thought it best to describe here the prevalent Tasmanian forms only.

a. *Stems creeping. Flowers axillary. Peduncles of the fruit erect, slender, much longer than the leaves.*

1. **Epilobium tenuipes** (Nob. in Fl. N. Zeal. i. 59); pusillum, caulibus brevibus e basi repente decumbentibus bifariam pubescentibus, foliis confertis oppositis sessilibus anguste lineari-oblongis obscure dentatis coriaceis glaberrimis, pedunculis fructiferis gracilibus strictis capsula glabrata longioribus. (*Gunn*, 1066, 2028.)

Hab. Abundant on the summit of Mount Olympus, forming large patches; Isis River, Middlesex Plains, *Gunn*.—(Fl. Jan.)

Distrib. New Zealand.

The small size, procumbent habit, glabrous foliage and capsules, creeping stem, crowded, linear-oblong, erect, coriaceous, usually opposite leaves, and slender peduncles of the ripe fruit, at once distinguish this pretty little species from its Tasmanian congeners. I have seen an abundance of specimens, but from only two localities: whole plant about two inches long; leaves $\frac{1}{3}$ inch long; peduncles of ripe fruit 1 inch, capsules shorter.—The comparative length of the peduncles and capsules are very variable characters in this genus, and much allowance must be made for the above description.

b. *Stems erect, or decumbent at the very base only. Peduncles of the fruit not much elongated.*

2. **Epilobium pallidiflorum** (Solander, MSS.); puberulum v. glabratum, caulibus e basi decumbente strictis erectis foliosis teretibus, foliis oppositis sessilibus semiamplexicaulibus anguste linearioblongis lanceolatisve eroso-serratis venis subparallelis, floribus in axillis superioribus subracemosis, pedunculis ovariisque cinereo-pubescentibus, floribus amplis.—*A. Cunn. Prodr. Fl. N. Zeal. in Ann. Nat. Hist.* iii. 34; *Fl. N. Zeal.* i. 61. E. macranthum, *Nob. in Hook. Ic. Pl. t.* 297. (*Gunn*, 252.)

Hab. Very common in ditches, marshes, etc., especially in the northern parts of the Colony, as at Formosa and Circular Head, *Gunn.*—(Fl. Dec. Jan.) (*v. v.*)

Distrib. New Zealand.

A very handsome plant, readily distinguished by its great size, opposite, narrow, semiamplexicaul leaves, with somewhat parallel veins, and large flowers.—*Stems* creeping at the base, 2–3 feet high, terete, glabrous, puberulous at the tips. *Leaves* linear-oblong or lanceolate, acute, 1–3 inches long, toothed, generally glabrous. *Flowers* numerous, nearly an inch across. *Peduncles* stout, and *ovaries* covered with cinereous down.

3. **Epilobium Billardierianum** (Ser. in DC. Prodr. iii. 41); glabratum, caule basi breviter decumbente dein stricto erecto simplici v. parce ramoso, foliis oppositis sessilibus semiamplexicaulibus (inferioribus interdum breve petiolatis) oblongis obtusis dentatis, pedicellis axillis superioribus folio plerumque brevioribus, capsulis elongatis pubescentibus glabratisve, floribus majusculis.—*Fl. N. Zeal.* i. 61. (*Gunn*, 804, 805.) (Tab. XXI.)

Hab. Common in alpine situations, as on the Hampshire Hills, Middlesex Plains, etc., *Gunn.*—(Fl. Feb.) (*v. v.*)

Distrib. New Zealand.

The largest-flowered Tasmanian species, except *E. pallidiflorum;* best recognized by this character, combined with the opposite, sessile, oblong, toothed, blunt leaves. *Stems* 8 inches to 2 feet high, strict, erect, or decumbent at the base, simple or sparingly branched, often red. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ inch long, the uppermost only alternate. *Peduncles* of the fruit short. *Flowers* $\frac{1}{3}$–1 inch across, white or pink, dark outside.—Plate XXI. Fig. 1, upper part of ovary, calyx, and corolla; 2, a petal; 3, calyx-lobes, stamens, and style:—*all magnified.*

4. **Epilobium tetragonum** (Linn. Sp. Pl. 494); glabratum v. puberulum (rarius pubescens), caule erecto subsimplici tereti v. obscure tetragono, foliis oppositis sessilibus v. semiamplexicaulibus oblongis obtusis eroso-dentatis glabris, pedunculis plurimis axillis supremis folio brevioribus, capsulis elongatis pubescentibus, floribus parvis.—*DC. Prodr.* iii. 43; *Engl. Bot. t.* 1948; *Fl. Ant.* ii. 270; *Fl. N. Zeal.* i. 60. (*Gunn*, 406 of 1842, 805.)

Hab. Common in moist, especially alpine, places throughout the Colony, *Lawrence, Gunn.*—(Fl. Dec. Jan.) (*v. v.*)

Distrib. South-eastern Australia, New Zealand, temperate South America, and throughout the north temperate and subarctic zones.

The *E. tetragonum*, described above, has been the subject of much study. It is an extremely variable plant, like all its congeners. Its more prominent characters as a Tasmanian species are its strict, robust, glabrous stems,

often large, broad, glabrous foliage, and very small flowers on pubescent ovaries; specimens with larger flowers and smaller leaves appear to pass into *E. Billardierianum;* and others, with narrower bases of the leaves, into *E. glabellum.*

5. **Epilobium glabellum** (Forst. ex Spreng. Syst. ii. 233); caule simplici v. ramoso erecto v. basi decumbente ramis erectis, foliis oppositis breve petiolatis ovatis v. oblongo-ovatis lineari-oblongisve obtusis remote sinuato-dentatis, floribus paucis, capsulis puberulis glabratisve, floribus parvis.—*Fl. N. Zeal.* i. 60. (*Gunn,* 399, 803 of 1837, and 805 of 1847.)

Hab. Port Arthur, *Backhouse;* Emu River, Hampshire Hills; sides of Mount Olympus, *Gunn;* Sarah Island, *Milligan.*—(Fl. Jan. Feb.) (*v. v.*)

Distrib. New Zealand.

The petioled, opposite leaves are the best character whereby to distinguish this species from the other Tasmanian ones; it is a common New Zealand plant, but I have only seen two characteristic Tasmanian specimens; small states of this pass into *E. alpinum* of the European mountains, and others closely resemble *E. alsinoides,* also a European mountain plant.

6. **Epilobium junceum** (Forst. ex Spreng. Syst. ii. 233); totum pubescens tomentosum v. villosum, caulibus erectis decumbentibusve strictis v. flexuosis, foliis lineari-oblongis obtusis remote grosse dentatis marginibus sæpe recurvis, pedunculis plurimis e axillis superioribus subracemosis, capsulis elongatis cano-pubescentibus, floribus parvis.—*Fl. N. Zeal.* i. 60. E. puberulum, *Hook. et Arn. Bot. Misc.* iii. 309. E. denticulatum, *Ruiz et Pavon, Fl. Peruv.* iii. 78. *t.* 314. E. virgatum *et* E. incanum, *A. Cunn. Prodr. Fl. N. Zeal. in Ann. Nat. Hist.* iii. 34. E. pedicellare, *Presl, Rel. Hænk.* ii. 30.

Var. *α;* stricta, erecta, virgata, simplex v. parce ramosa, foliis 1–2-uncialibus tomentosis. (*Gunn,* 82, 255.)

Var. *β;* suberecta, robusta, ramosa, ramis erectis, foliis ut in *α.* (*Gunn,* 406.)

Var. *γ;* decumbens v. ascendens, cano-puberula, caule gracili flexuoso ramosissimo, foliis minoribus. (*Gunn,* 253, 254.)

Hab. Abundant throughout the Colony, by waysides and in pastures, etc.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. South-eastern and South-western Australia, New Zealand, and extratropical western South America.

The alternate narrow oblong or linear-oblong, remotely toothed leaves, are the best character for this species, which varies even more than its Tasmanian congeners in habit, pubescence, stature, etc. The two best-marked forms,—one erect, stout, strict, nearly simple; the other decumbent, flexuose, slender, much branched,—are certainly far more dissimilar than any two of the last three species of the genus; but they are inseparably connected by a host of intermediate grades, both in Tasmania and in New Zealand, where it is one of the commonest plants.

Gen. II. ŒNOTHERA, *L.*

Calycis tubus supra ovarium productus, limbi decidui lobis 4 sæpe varie connatis. *Petala* 4, annulo inserta, brevissime unguiculata. *Stamina* 8. *Ovarium* 4-loculare, ovulis angulo centrali affixis. *Capsula* loculicide 4-valvis. *Semina* plurima; testa crassa, non carnosa.

A very extensive genus, exclusively American, with the exception of the Tasmanian species; very common in gardens, whence several species have escaped, and become naturalized in various countries. The genus is very nearly allied to *Epilobium,* from which it is distinguished by the tube of the calyx being elongated beyond the ovary, its often adherent lobes, and the naked seeds. (Name said to be from οινος, *wine,* and θηραω, *to chase;* referring to a plant, the roots of which were eaten as incentives to wine-drinking; or perhaps to dispel, or *chase,* the effects of wine.)

1. **Œnothera Tasmanica** (Hook. fil. in Lond. Journ. Bot. vi. 475); parvula, caulibus prostratis divaricatim ramosis basi repentibus glabris, foliis sessilibus oppositis alternisque linearibus lineari-oblongisve obtusis crispato-dentatis glaberrimis, floribus parvis, calycis tubo (ultra ovarium) brevi infundibuliformi, antheris breviter oblongis, stigmate clavato, capsula cylindraceo-tetragona torulosa pubescente, seminibus obovatis plano-convexis, hilo umbilicali, marginibus subincrassatis. (*Gunn*, 1065.)

Hab. In alpine marshes at Marlborough, *Gunn*.—(Fl. Jan.)

Very closely allied to the *Œ. dentata*, a plant which ranges from South Chili to the Andes of North America, agreeing with that species in habit, in the small flowers, short prolongation of the calyx-tube, and clavate or almost globose stigma, but differing in the shorter, less angled pod, and more procumbent habit.—*Stems* slender, a few inches to a span long, procumbent, creeping at the base. *Leaves* glabrous, linear or linear-oblong, toothed, $\frac{1}{3}$–$\frac{2}{3}$ inch long. *Flowers* small, purplish? *Petals* unequally lobed, as short as the lobes of the calyx. *Capsules* axillary sessile, pubescent, rather longer than the leaves.

Nat. Ord. XXIX. HALORAGEÆ.

Australia is the head-quarters of this curious Natural Family, which is composed almost unexceptionally of obscure weeds, having in many cases very little to recommend them to the inexperienced observer. In a systematic point of view, many of the genera are very obscurely related to one another, and include water and land plants, with very different habits and floral characters. One of the genera, *Callitriche*, is indeed excluded from *Haloragea* by many authors, though originally referred to it by Mr. Brown, and having no affinity with any other known genus of plants. The albumen in the seed, which is the character by which the Order is best distinguished from *Onagrariæ*, has been erroneously described as wanting in the genus *Myriophyllum*. About forty-five species of Australian *Haloragea* are known.

Gen. I. HALORAGIS, *Forst.*

Calycis tubus teres, angulatus v. alatus; limbi lobis 4, persistentibus. *Petala* 4, concava, decidua. *Stamina* 4–8; antheris longitudinaliter dehiscentibus. *Stigmata* 4, simplicia v. plumosa. *Fructus* indehiscens, 2–4-locularis. *Semina* loculis solitaria, pendula. *Embryo* in axi albuminis carnosi, teres.

I have in the 'New Zealand Flora' adopted Brown's view (General Remarks on the Vegetation of Australia, App. Flind. Voy.), and brought together *Goniocarpus* and *Cercodia* under *Haloragis*, not being able to find any satisfactory characters for keeping them separate. As thus constituted, *Haloragis* is a large genus, but a very natural one, almost confined to the southern hemisphere, and to Australia especially; the chief exceptions being *H. alata*, a native of South Chili and New Zealand, and *H. micrantha*, a Tasmanian species, which extends to New Zealand, India, China, and Japan.—Erect or prostrate or creeping herbs, smooth or scabrid, often inhabiting dry places. *Flowers* hermaphrodite or bisexual, small, axillary or racemed at the end of the branches, green or purplish, sessile or pedicelled. *Calyx* terete, or angled, or winged; limb four-lobed. *Petals* four, concave, very deciduous, often boat-shaped. *Stamens* four to eight. *Anthers* long, on short filaments. *Stigmas* four, sessile, papillose or plumose. *Fruit* small, hard or coriaceous, often dark brown, shining, and angled, crustaceous or coriaceous, indehiscent, two- to four-lobed. (Name from ἅλς, *the sea*, and ῥαξ, *a grape-stone*; from the form of the fruit of the original species, which grows near the sea.)

a. *Leaves alternate.*

1. **Haloragis pinnatifida** (Asa Gray, in Bot. U.S. Expl. Exp. i. 627); lævis v. scaberula, caule basi decumbente ramosissimo, ramis gracilibus ascendentibus sulcatis, foliis alternis linearibus remote irre-

gulariter pinnatifido-inciso-lobatis, floribus in axillis supremis subsessilibus alternis oppositisve, stigmatibus breviter plumosis, ovario pubescente subgloboso 4-loculari obscure 8-costato. (*Gunn*, 1961, 559.)

Hab. Northern parts of the Colony, South Esk River, *Gunn.*—(Fl. Feb.)

Distrib. South-east Australia.

The almost invariably alternate, linear, irregularly cut, and almost pinnatifidly lobed leaves, at once distinguish this species from its Tasmanian allies. Owing to the fruit being very immature, I am doubtful whether it is eight-angled (and thence a *Goniocarpus*), or globose, which would refer it to *Cercodia*.—*Stems* much branched at the base. *Branches* ascending, slender, a span and upwards long, grooved, smooth below, scabrid at the tips. *Leaves* few, scattered, 1 inch long, $\frac{1}{6}$ inch broad, scaberulous. *Flowers* monœcious, sessile or very shortly pedicelled. *Calyx*-tube broad, pubescent or scabrid, its lobes triangular, ovate, acute. *Petals* as long as, or longer than, the calyx, linear-oblong, scabrid at the back. *Stamens* eight. *Anthers* slender. *Stigmata* shortly plumose in the female flowers. *Young fruit* obscurely eight-angled.

b. *Leaves opposite.*

2. **Haloragis Gunnii** (Hook. fil.); scabrida, caule erecto basi suffruticoso trichotome ramoso, ramis strigoso-hispidis, foliis coriaceis breve petiolatis v. sessilibus ovatis subacutis grosse argute serratis utrinque scabridis, floribus in axillis superioribus oppositis sessilibus, petalis breviusculis, fructu globoso 8-costato verruculoso v. scaberulo.—H. elata, *Nob. in Lond. Journ. Bot.* vi. 475; *non Fenzl in Plant. Hügel.* (*Gunn*, 1958.)

Hab. Abundant in wet, shaded places, *Gunn, etc.*—(Fl. Oct. Nov.) (*v. v.*)

The largest species of the genus, distinguished by its great size.—*Stems* 2–3 feet high, simple, and almost woody at the base, very scabrid, trichotomously branched above; *branches* suberect, slender. *Leaves* opposite, small, $\frac{1}{4}$–$\frac{3}{4}$ inch long, sessile or shortly petioled, ovate or cordate, coarsely sharply serrate, scabrid on both surfaces. *Flowers* minute, almost sessile in the axils of the uppermost leaves, opposite. *Fruit* eight-ribbed, scabrid.—Asa Gray (Bot. U.S. Expl. Exped.) doubtfully refers this to *H. teucrioides*, DC., which however appears to me to be a very different plant, with much narrower leaves.

3. **Haloragis tetragyna** (Hook. fil. Fl. N. Zeal. i. 63); rigida, scabra, caule prostrato v. ascendente ramoso, ramis tetragonis erectis, foliis oppositis duris coriaceis oblongis ovatis lanceolatisve acutis grosse acute serratis utrinque scabris, floribus versus apices ramulorum axillis foliorum parvorum racemoso-spicatis alternis brevissime pedicellatis, fructu ovoideo 8-costato rugoso v. lævi immaturo scaberulo.—Goniocarpus tetragyna, *Lab. Fl. N. Holl.* i. 39. *t.* 53; *De Cand. Prodr.* iii. 66. (*Gunn*, 85.)

Hab. Common in dry stony places, fields, etc.—(*v. v.*)

Distrib. South-eastern Australia and New Zealand.

The alternate racemose or spicate flowers, with small bracteal leaves, distinguish this from all the Tasmanian species but *H. micrantha*, which is a much more delicate and smaller species.—Everywhere scabrid with short, stiff, white hairs.—*Stems* decumbent, erect, or diffuse, 3–8 inches long. *Leaves* opposite, sessile, rounded, $\frac{1}{4}$–$\frac{2}{3}$ inch long, subacute, rigid, acutely serrate, with cartilaginous margins. *Flowers* in the axils of the small upper alternate leaves. *Fruit* variable in size, shape, colour, and amount of hairiness.

4. **Haloragis depressa** (Walp. Rep. ii. 99); pusilla, caule prostrato v. ascendente filiformi scaberulo, foliis oppositis breve petiolatis lanceolatis ovatis suborbiculatisve acutis obtusisve grosse cartilagineo-serratis integerrimisve glaberrimis v. superne scaberulis, floribus 4-andris oppositis in axillis supremis sessilibus, fructu nitido 4–8-costato.—Goniocarpus depressus, *A. Cunn. Fl. N. Zeal. in Ann. Nat. Hist.* iii. 30; *Fl. N. Zeal.* i. 63. G. serpyllifolius *et* G. vernicosus, *Hook. fil. in Ic. Plant. t.* 290 *et* 311.

Var. β. *montana;* robustior, caulibus crassiusculis, foliis majoribus ovatis v. ovato-cordatis.

Hab. Abundant in alpine and subalpine situations, *Gunn, etc.*—(Fl. Dec. to Feb.) Var. β. Arthur's Lake, and summit of the Western Mountains, *Gunn.*

Distrib. New Zealand.

A common and very variable little species, usually smaller than *G. tetragyna*, from which it is readily distinguished by the opposite flowers.—*Stems* very slender, rough, prostrate or ascending, straggling or densely tufted, sometimes excessively numerous from the root, 2–10 inches long. *Leaves* small, all opposite, ¼–½ inch long, rigid and scabrid, ovate, rarely lanceolate or orbicular, generally acute, toothed and glabrous, rarely blunt, quite entire. *Flowers* rather large for the small size of the plant, sessile. *Fruit* turgid, four- to eight-ribbed, shining.—The variety β, *montana*, is much larger and more robust: I had hence supposed it to be a different species, but I find no characters whatever beyond the greater size, luxuriant habit, and sometimes obscurely cordate leaves. The flowers and fruit are identical with those of *H. depressa.*

5. **Haloragis micrantha** (Br. in Flind. Voy. App. 550); tenella, glaberrima, caulibus filiformibus ramosis prostratis ascendentibusve apice longe aphyllis, foliis paucis oppositis sessilibus orbiculatis late ovatisve grosse pauce cartilagineo-serratis, racemis elongatis sæpe divaricatim ramosis, floribus alternis ebracteatis (bracteolis minimis) breve pedicellatis pendulis, fructibus oblongo-globosis nitidis 8-costatis.—*Sieb. et Zucc. Fam. Nat. Jap. in Abhandl. Acad. Monac.* i. 25; *Asa Gray in Bot. U. S. Expl. Exp.* i. 626. Goniocarpus micranthus, *Thunb. Fl. Jap.* 69. *t.* 15; *Kœnig in Ann. Bot.* 546. *t.* 12. *f.* 5; *De Cand. Prodr.* iii. 66. G. citriodorus, *A. Cunn. Prodr. Fl. N. Zeal.* G. microcarpus, *Thill. DC. l. c.* G. rotundifolius, *Ferd. Mueller.* Haloragis tenella, *Bronyn. in Duperrey Voy. t.* 68 (*non DC.*); *Fl. N. Zeal.* i. 63. (*Gunn*, 884.)

Hab. Abundant in moist, sandy soil, in several parts of the Colony, *Gunn.*—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia, New Zealand, the Khasia Mountains in Bengal, Japan.

Much the smallest and most slender of the Tasmanian species, easily recognized by its wiry stems, few, broad, glabrous leaves, and long, branched, filiform, leafless racemes of very minute, pendulous, alternate, ebracteate, purple flowers. This plant has a very wide distribution.—I am indebted to Asa Gray for identifying it with the Japanese plant of Thunberg.

Gen. II. MYRIOPHYLLUM, *Vaill.*

Flores unisexuales v. hermaphroditi, bibracteolati. *Calycis* limbus 4-lobus, interdum brevissimus v. 0. *Petala* in fl. ♀ 0, in fl. ♂ 4, concava, membranacea, decidua. *Stamina* 2–8; filamentis sæpius brevibus, antheris linearibus. *Carpella* 4, plus minusve arcte cohærentia, apice stigmatibus plumosis abrupte terminata. *Fructus* nucumentaceus, 4-coccus. *Semina* pendula, albumine parco; *embryone* axili, tereti; *radicula* elongata.—Herbæ *aquaticæ;* foliis *oppositis, verticillatis alternisve;* floribus *axillaribus, solitariis, subsessilibus, inconspicuis.*

Water-herbs, found in all parts of the globe, with submerged, flaccid stems, and whorled lower capillaceo-multifid leaves, the upper leaves often solitary and entire, and sometimes all are entire and opposite or alternate.—*Flowers* sessile, axillary, rarely if ever hermaphrodite. *Calyx* in the female flowers with no limb or a four-toothed one: in the male four-sepaled. *Petals*, none in the female flower; four, concave and deciduous in the male, rarely absent. *Stamens* two to eight, with short filaments. *Fruit* of four oblong cocci more or less united together, each crowned with the withered remains of a feathery stigma. (Name from μυριας, *a myriad*, and φυλλον, *a leaf.*)

a. *Leaves whorled. Stamens* 8.

1. **Myriophyllum elatinoides** (Gaud. in Ann. Sc. Nat. v. 105); foliis 4–5-natim verticillatis inferioribus capillaceo-multifidis intermediis pinnatifidis superioribus linearibus oblongisve acutis acumina-

tisve integerrimis v. grosse et irregulariter serratis pinnatifidisve, fl. ♂ 8-andris, calycis lobis minutis, carpellis lævibus.—*De Cand. Prodr.* iii. 68; *Fl. Ant.* ii. 271; *Fl. N. Zeal.* i. 63. (*Gunn*, 75, *ex parte.*)

Hab. Fresh and brackish water, Georgetown, and in the Derwent, *Gunn.*—(Fl. Oct. to Feb.) (*v. v.*)

Distrib. South-eastern Australia, New Zealand, and extratropical South America.

A common water-weed, forming dense masses, in still or gently-flowing waters.—*Stems* sometimes many feet long, their apices raised above the water when flowering. *Lower submerged leaves* crowded, capillaceo-multifid; those higher up the stem shorter, pinnatifid, the upper five to seven in a whorl, linear-oblong or lanceolate, acute, acuminate or blunt, toothed, laciniated or entire, $\frac{1}{4}$–$\frac{1}{2}$ inch long. *Flowers* dicœcious, sessile in the axils of the uppermost leaves: *females* with no calyx or corolla: *males* with a minute calyx, four petals, and eight stamens. *Fruit* smooth, or nearly so.

2. **Myriophyllum variæfolium** (Hook. fil. Ic. Plant. t. 289); caulibus elongatis, foliis 5–7-natim verticillatis confertis, inferioribus capillaceo-multifidis, intermediis pectinatis, superioribus anguste linearibus integerrimis, fl. ♂ 8-andris, calycis lobis petalis $\frac{1}{2}$ brevioribus, carpellis lævibus.—*Fl. N. Zeal.* i. 64. (*Gunn*, 75, *ex parte.*)

Hab. Abundant in fresh water throughout the Colony, *Gunn.*—(Fl. Oct. to Feb.) (*v. v.*)

Distrib. South-eastern Australia and New Zealand.

Stems several feet long, generally much stouter and more succulent than those of *M. variæfolium.* *Leaves* seven in a whorl, the lower capillaceo-multifid, the intermediate ones pectinate, the upper quite entire, linear, all crowded; in young specimens all the upper are pectinate; in shallow water the whorls of multifid leaves are few, distant, and small. *Flowers* dicœcious: *males* with four small sepals: *females* with short, plumose styles, and linear-oblong carpels, which have not been examined ripe.

b. *Leaves opposite. Stamens* 8. *Female flowers with a four-toothed calyx.*

3. **Myriophyllum amphibium** (Lab. Nov. Holl. ii. 70. t. 220); prostratum, caulibus brevibus crassiusculis, foliis oppositis obovato-oblongis spathulatisve obtusis integerrimis, floribus sessilibus, fl. ♂ lobis calycinis petalis $\frac{1}{2}$ brevioribus, staminibus 8, fl. ♀ calyce 4-dentato, carpellis turgidis lævibus, stylis subelongatis recurvis. (*Gunn*, 1068.)

Hab. Wet places, Recherche Bay, *Labillardière, Gunn.*—(Fl. Dec.)

Distrib. South-western Australia.

Very unlike the preceding species, and more resembling *Callitriche.*—*Stems* prostrate in mud, 2–6 inches long, sparingly branched. *Leaves* opposite, spathulate, $\frac{1}{4}$–$\frac{1}{3}$ inch long. *Flowers* very minute, sessile, females most numerous. *Calyx* four-toothed, teeth alternating with the stigmata, and almost hidden between the carpels; male flowers with a four-lobed calyx half as long as the petals. *Fruit* of smooth, punctate carpels, with rather long, recurved styles; *albumen* scanty; *embryo* cylindrical, stout, straight.

4. **Myriophyllum pedunculatum** (Hook. fil. in Lond. Journ. Bot. vi. 474); parvulum, foliis oppositis linearibus, floribus pedicellatis, fl. ♂ calycis lobis lanceolatis petalis linearibus $\frac{1}{2}$ brevioribus, staminibus 8, fl. ♀ calyce 4-dentato, stylis recurvis plumosis, fructibus sicco rugosis.—M. simplicifolium, *Ferd. Mueller.* (*Gunn*, 1959, 2020.) (Tab. XXIII. *B.*)

Var. *α*; foliis subspathulatis, floribus plerisque pedicellatis.

Var. *β*; foliis linearibus carnosis, floribus sessilibus.

Hab. Abundant in shallow pools and inundated river-banks, ascending to 4000 feet, *Gunn.*—(Fl. Dec. to Feb.)

Distrib. Mountains of South-eastern Australia; elev. 6000 feet, *Mueller.*

Stems succulent, erect, tufted, sparingly branched, 2 inches to a span high, of a red-brown colour, as is the

foliage. *Leaves* linear or subspathulate, $\frac{1}{8}$–$\frac{1}{3}$ inch long. *Flowers* in most respects quite like those of *M. amphibium*, but pedicelled, and with ripe carpels wrinkled when dry.—PLATE XXIII. *B.* Fig. 1, branch with leaves and flowers; 2, male flower; 3, same with petals and stamens removed; 4, petal; 5, stamen; 6, female flower; 7, the same more advanced; 8, carpel; 9, more advanced ditto; 10, the same cut vertically; 11, seed; 12, vertical section of ditto; 13, transverse section of stem:—*all magnified.*

c. *Leaves alternate. Stamens* 2–4.—(Pelonastes, *H.f. in Lond. Journ. Bot.* vi. 474.)

5. **Myriophyllum integrifolium** (H.f.); minimum, prostratum, vage ramosum, foliis alternis subulatis, fl. ♂ solitariis terminalibus, petalis persistentibus, staminibus 2–4, fl. ♀ axillaribus sessilibus.—Pelonastes integrifolia, *H.f. in Lond. Journ. Bot. l. c.* P. tillæacea, *F. Mueller.* (TAB. XXIII. *A.*) (*Gunn.* 2011, 2013.)

HAB. Wet places in pastures, lagoons, etc., *Gunn.*—(Fl. Nov.)

DISTRIB. South-eastern Australia (Emu Flats, *Mueller*).

A very minute, prostrate plant, $\frac{1}{2}$–1 inch long, with spreading branchlets and patent subulate leaves, $\frac{1}{8}$–$\frac{1}{6}$ inch long, of a pale green or red-brown colour.—*Male flowers* solitary, terminal, sessile or shortly pedicelled, apparently often imperfect; in many of my Australian and Tasmanian specimens, I make out four persistent petals and two bracts in some specimens, in others many irregularly-placed bracts, or perhaps petals of imperfect flowers. *Stamens* two to four. *Female flowers* axillary, sessile, of four turgid carpels, with no calyx-limb, short stigmata, and two subulate bracts.—PLATE XXIII. *A.* Fig. 1, branch with leaves and flowers; 2, male flower; 3, the same spread open; 4, petal; 5, anther; 6, female flower; 7, vertical section of ovary; 8, ripe carpel; 9, vertical section of ditto; 10, seed; 11, vertical section of ditto; 12, embryo:—*all magnified.*

Gen. III. MEIONECTES, *Br.*

Flores hermaphroditi. *Calycis tubus* compressus, limbi lobis 2. *Petala* 2. *Stamina* 4. *Ovarium* 2-loculare; stigmata 2, apice papillosa. *Fructus* nucumentaceus, 2-locularis; *endocarpio* rugoso. *Embryo* cylindricus, axi albuminis carnosi et oleosi.—Herbæ *aquaticæ;* foliis *alternis, pinnatifidis;* floribus *axillaribus, parvis.*

A remarkable genus, first indicated by Mr. Brown in the 'Appendix to Flinders' Voyage,' who discovered a much larger species than the Tasmanian one on the south coast of Australia. Only two species are described, and both are herbaceous water-plants, with flexuous, branching stems, alternate, pinnatifid leaves, and axillary, hermaphrodite flowers.—*Calyx*-tube ovate, compressed, limb two-lobed. *Petals* two, membranous, deciduous. *Stamens* four. *Styles* conical, with papillose tips. *Fruit* a much-compressed, two-celled, two-seeded nut, crowned with the calyx-lobes. *Seed* linear-oblong, pendulous, with the raphe towards the axis, and a basal chalaza. *Testa* membranous. *Albumen* fleshy. *Embryo* cylindrical, axile, half the length of the seed. (Name from μειων, *half*, and εχω, *to have;* in allusion to the reduced number of parts of the flower.)

1. **Meionectes Brownii** (Hook. fil. in Ic. Plant. t. 306); caulibus gracilibus ramosis, foliis late oblongis profunde pinnatifidis sub-bipinnatifidisve, segmentis remotis anguste linearibus divaricatis simplicibus bi-trifidisve. (*Gunn,* 883.)

HAB. Pools of fresh water at Circular Head and other places in the northern parts of the Colony, *Gunn.*—(Fl. Feb.)

DISTRIB. South-eastern Australia.

Stems flaccid, slender, a few inches to a span long. *Leaves* deeply pinnatifidly cut into long, narrow, spreading, simple, bifid or trifid lobes. *Flowers* very small, pedicelled.

Gen. IV. CALLITRICHE, *L.*

Flores plerumque monoici, bibracteolati v. ebracteolati. ♂ *Calyx* et *corolla* 0. *Stamen* 1. ♀ *Ovarium* 4-lobum, 4-loculare. *Styli* 2, filiformes, papillosi. *Fructus* compressus, indehiscens, constans carpellis 4 unilocularibus monospermis. *Semina* pendula, teretiuscula, albuminosa.—Herbæ *tenellæ, aquaticæ;* foliis *oppositis, integerrimis;* floribus *subsessilibus, axillaribus, inconspicuis.*

A genus of water-plants, found in all temperate and many warm latitudes at a sufficient elevation above the sea-level; the species are extremely variable, growing in water of various depths, and sometimes on the surface of wet soil in humid situations. The Tasmanian species is almost a cosmopolitan plant.—Slender, aquatic herbs, with opposite, entire, linear or spathulate leaves, the upper often largest, crowded, and spread out in a stellate manner on the surface of the water, whence the English name "Star-wort."—*Flowers* axillary, usually monœcious. *Males* of a solitary stamen, with two caducous bracts at its base, which are sometimes absent; *filament* longer than in *Haloragea* generally, and *anther* also different from that typical of the Order, being didymous, with short cells, and the valves recurved from above, so that the anther appears after dehiscence to be one-celled, and to have burst transversely across the crown. *Female flowers* with two bracts or none, consisting of four flat carpels united in pairs, and two long, subulate, recurved, papillose styles (or rather stigmata). *Fruit*, the four carpels rather indurated, each one-celled, one-seeded. *Seeds* pendulous, with a thin, membranous testa, fleshy albumen, and terete embryo. (Name from καλος, *beautiful*, and θριξ, *a hair;* in allusion to the long, slender stems.)

1. **Callitriche verna** (Linn. Sp. Pl. 2); foliis 3-nerviis, fl. ♀ subsessili. — *De Cand. Prodr.* i. 70; *Fl. Antarct.* i. 11, ii. 272; *Fl. N. Zeal.* i. 64. C. aquatica, *Smith, Engl. Bot. t.* 722. (*Gunn,* 1960.)

Var. *terrestris;* caule rigidiore, foliis brevibus. (*Gunn,* 2021.)

Hab. Common in still, fresh water, margins of rivers, etc.—Var. β. In moist ground, Circular Head, *Gunn.* (*v. v.*)

Distrib. South-eastern Australia, New Zealand, the Antarctic Islands, Europe, Northern Asia and America.

Stems slender, herbaceous, green, when floating often a span to 2 feet long; in var. β more rigid, shorter, and prostrate. *Leaves* membranous, spathulate, $\frac{1}{4}$–$\frac{2}{3}$ inch long, blunt, three-nerved.—In Tasmanian and New Zealand specimens the male and female flowers are sometimes collateral in the same axil and on the same pedicel, when the single stamen appears as if it belonged to the same flower with the single pistil, but the insertion of the filament is manifestly not hypogynous, but arising from the very short pedicel of the female flower. The bracts are often absent in this form.

Gen. V. GUNNERA, *L.*

(Milligania, *H.f.*)

Flores bracteolati, 1-sexuales v. hermaphroditi. *Calycis* tubus teres v. angulatus; limbus 2–3-lobus. *Petala* 0 v. 2, coriacea, decidua. *Stamina* 1–2; antheris innatis, 2-locularibus, loculis lateraliter dehiscentibus. *Ovarium* 1-loculare, 1-ovulatum; stigmata 2, elongata, simplicia (rarius 4, per paria cohærentia), ubique papillosa. *Fructus* drupaceus, indehiscens, endocarpio crustaceo v. osseo. *Semen* pendulum; *testa* membranacea, parietibus loculi sæpe adhærente; *albumine* copioso carnoso; *embryone* minimo cordato; *radicula* brevi obtusa hilo proxima.—Herbæ; foliis *alternis.*

The Tasmanian species is the only Australian representative of this very curious genus, which is almost confined to the south temperate and Antarctic zones, but which numbers very few species; these are chiefly insular, there being representatives in Java, New Zealand, the Society and Sandwich Islands, Peruvian Andes, Chili, Fuegia, and the Cape of Good Hope. The Tasmanian one differs from its congeners in its capitate female flowers.—*Herbs,* with alternate

petioled leaves, and simple or branching flower-stems. *Flowers* unisexual or hermaphrodite. *Calyx*-tube of the female flower usually compressed; limb two- or three-lobed, in the male sometimes wanting, or reduced to a few scales. *Petals* two or absent. *Stamens* one or two, opposite the petals when the latter are present. *Ovary* one-celled, with one pendulous ovule, and two subulate stigmata. *Fruit* a small drupe. *Seed* broadly obovate, compressed, generally filling the cavity of the fruit, to which its membranous testa often adheres. *Albumen* copious, fleshy; *embryo* very minute, broadly obovate, the radicle close to the hilum, the cotyledonary end notched. (Named in honour of *John Ernest Gunner*, a learned Swedish Bishop and Botanist.)

1. **Gunnera cordifolia** (Hook. fil.); dioica v. monoica, acaulis, foliis patentibus late ovato- v. cordato-rotundatis obtusis obscure crenatis superne glabris, fl. ♂ spicatis, staminibus 1–2, filamento brevissimo, fl. ♀ capitatis apetalis, ovario compresso, calycis lobis inæqualibus pilosis, stigmatibus elongatis erectis, drupa subtrigona.—Milligania cordifolia, *Nob. in Lond. Journ. Bot. t.* 299. (*Gunn*, 877.)

Hab. Abundant in springs and marshes in alpine situations, elev. 3–5000 feet, covering large tracts of ground, *Gunn.*—(Fl. Jan.) (*v. v.*)

I much regret having to reduce the genus *Milligania** (which I had many years ago the pleasure of naming after one of the most zealous Tasmanian botanists), to one already well known; at the time I established it, the species of *Gunnera* were not well described, and having gathered and examined several since then, I am convinced that they constitute but one genus. The *G. cordifolia* however differs from the originally described species in the frequent absence or great imperfection of the male perianth, and is hence referable to the same section as the Fuegian species, of which the genus *Dysemone* was made by Solander (and *Misandra* by Commerson).—A succulent fleshy herb, growing quite appressed to the ground, and throwing out strong rooting stolons. *Leaves* 2–3 inches long (including the stout petiole), crowded and spread out in a stellate manner, broadly ovate or orbicular, sometimes cordate at the base, more or less pilose on the petiole, ribs, and back, crenate at the edges, sometimes obscurely lobed. *Male flowers* consisting of one or two, bibracteate, almost sessile anthers, spiked on hairy peduncles, 2–3 inches long. *Anther* broadly oblong, opening by lateral slits. *Female flowers* capitate, on short, stout peduncles (sometimes a few are found at the base of the male spike), compressed. *Calyx*-limb of two unequal lobes (with sometimes one or two minute intermediate lobes?); lobes anticous and posticous, short, oblong, blunt, ciliated, the anterior sometimes twice as long as the other. *Stigmas* slender or stout, subulate, much longer than the ovary. *Fruits* aggregated in a head, as large as a raspberry, bright red, trigonous, turgid.—The flowers are apt to become monstrous, especially the females, which have then three or four stigmas, more or less irregularly combined in pairs, but never more than one cell in the ovarium, or one ovule. The calyx-lobes are often very irregularly disposed.

Nat. Ord. XXX. LYTHRARIEÆ.

Gen. I. LYTHRUM, *L.*

Calyx cylindricus, striatus, apice dentatus. *Petala* 4–6, apice tubi orta. *Stamina* aut medio aut basi calycis orta. *Ovarium* 2-loculare; ovulis numerosis, placentis dissepimento adnatis; stylo gracili; stigmate capitato. *Capsula* calyce inclusa, polysperma.—Herbæ; foliis *plerumque oppositis verticillatisve;* floribus *axillaribus, solitariis verticillatisve.*

The Tasmanian species of *Lythrum* are both Australian, and the only representatives of the genus (which is a large one) in that country; it is remarkable that both the species are common European and North American plants: the majority of their congeners are American.—*Herbs*, or rarely undershrubs, with usually opposite or whorled leaves, and whorled axillary flowers, arranged in an elongated spike. *Calyx*-tube long, cylindrical, generally many-

* This name is now transferred to a Tasmanian Liliaceous plant, figured in the 'Kew Journal of Botany' (vol. v. p. 296, t. ix.)

toothed at the mouth, the alternate teeth smaller. *Petals* four to six, placed at the mouth of the calyx. *Stamens* variable in number, placed on the tube, or at its base, and then almost hypogynous. *Ovary* two-celled, with many ovules attached to a spongy placenta on the axis. *Style* slender. *Stigma* capitate. *Capsule* enclosed in the tube of the calyx. (Name from λυθρον, *blood;* in allusion to the colour of the flowers.)

1. **Lythrum Salicaria** (Linn. Sp. Pl. 640); erectum, foliis oppositis verticillatisve linearibus lineari-lanceolatisve sessilibus basi cordatis.—*De Cand. Prodr.* iii. 82; *Engl. Bot. t.* 1061. (*Gunn,* 30.)

Hab. Common in wet places throughout the Colony.—(Fl. midsummer.) (*v. v.*)

Distrib. Eastern Australia, from the tropics southward, Europe, and temperate Asia and North America.

A very handsome and common plant, conspicuous for its long spikes of bright rose-coloured flowers.—Glabrous or pubescent. *Stems* four-angled, 2–4 feet high, leafy. *Leaves* 1–3 inches long, very variable in breadth, linear-lanceolate or narrow linear-oblong, acute, cordate at the base. *Spikes* a span to 1½ foot long. *Flowers* in axillary whorls, shortly pedicelled. *Calyx* about ⅓ inch long, deeply ribbed, very frequently six-toothed. *Petals* spreading, equal in number to the calyx-teeth. *Stamens* inserted near the base of the calyx, about twice as many as the petals; *filaments* slender; *anthers* small. *Style* very slender, exserted.—This is the common English "Loose-strife."

2. **Lythrum hyssopifolia** (Linn. Sp. Pl. 642); foliis oppositis alternisque lineari-oblongis lanceolatisve obtusis, floribus axillaribus subsessilibus, petalis oblongis, staminibus 5–8.—*De Cand. Prodr.* iii. 81; *Engl. Bot. t.* 292. (*Gunn,* 81.)

Hab. Northern part of the Island, *Gunn.* (Introd.?)

Distrib. South-east Australia, Europe, temperate North and South America, and South Africa.

A much smaller and more slender species than the preceding, glabrous.—*Stems* glabrous, ascending, slender, branched. *Leaves* alternate (rarely opposite), ½–1 inch long, sessile, linear-oblong, obtuse. *Flowers* solitary, sessile or shortly pedicelled.—This is the "Hyssop-leaved Loose-strife" of England, where it is a rare plant, though abundant in many other parts of the world.

Nat. Ord. XXXI. MYRTACEÆ.

This is one of the largest Australian families of plants, and bears in that country a greater proportion to other flowering plants than in any other part of the world. The species are no less remarkable for their variety and beauty, than for the nature of the timber of many, the odour of their foliage, and the singularity of their botanical characters. Upwards of 650 Australian *Myrtaceæ* are known, a great many of which are undescribed. The great majority of these belong to the Tribes *Chamælaucieæ* and *Leptospermeæ*, both of which are very rare out of Australia, the few *Myrteæ* proper, which number scarcely 20 known species, being almost exclusively tropical. The preponderance of the Order is also extratropical, there being 80 tropical species; 200 in the south-eastern extratropical, and nearly 400 in the south-western extratropical quarters of Australia. Scarcely a single species is common to the south-east and south-west shores of the continent, and many genera (upwards of 20), are wholly occidental, some of them containing a host of species, as *Genetyllis* (20), *Verticordia* (50), *Beaufortia* (15), *Calothamnos* (30). Other genera again, as *Agonis*, contain only one south-eastern species and many south-western, so that in every respect the maximum development of the Order is in the south-west.

Gen. I. CALYCOTHRIX, *Lab.*

Calyx bibracteolatus; tubo longe supra ovarium producto, gracili; limbi lobis 5, apice in setam

desinentibus. *Petala* 5, fauce calycis inserta. *Stamina* 10 v. plurima, cum petalis inserta, libera. *Ovarium* 1-loculare. *Ovula* 2, e placenta basilari erecta, anatropa. *Capsula* 5-costata, abortu monosperma.—Folia *sparsa;* stipulis *minutis*.

A very handsome and exclusively Australian genus, of which about fifty species are known: of these thirty are south-western, and ten tropical. The long, delicate bristle, terminating each lobe of the calyx, at once distinguishes it from its Tasmanian allies. It and the following belong to a peculiar Australian section of the Order (*Chamælaucieæ*), by some considered as a separate Order, in which the leaves are often alternate, sometimes stipulate, and the ovary is one-celled, with one or more erect ovules. (Name from καλυξ, *the calyx*, and θριξ, *a hair*.)

1. **Calycothrix glabra** (Br. in De Cand. Prodr. iii. 208); foliis petiolatis linearibus glabris margineve ciliatis, staminibus 12–20.—*Lindl. Bot. Reg. t.* 409; *Lodd. Bot. Cab. t.* 586. C. Brownii *et* C. Baueri, *Schauer, Monog. Myrt. Xeroc.* i. 109.

Var. *α. glaberrima;* ramulis brevibus dense foliosis, foliis trigonis anguste linearibus subacutis obtusisve superne (sicco) concavis non ciliatis. (*Gunn*, 13, 489, 490.)

Var. *β. virgata;* ramulis elongatis virgatis, foliis ut in var. *α*.—C. virgata, *A. Cunn. Bot. Mag. t.* 3323.

Var. *γ. ciliata;* ramulis brevibus fasciculatis pubescentibus, foliis dense congestis latioribus marginibus spinuloso-ciliatis. (*Gunn*, 806.)

Hab. Rocky coasts, in a sandy soil, in several places.—Var. *α*. West Head, Tamar River, Rocky Cape, and South Esk River. Var. *β*. Port Arthur. Var. *γ*. Sisters' Hills and Rocky Cape, *Gunn*.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

A shrub, 2–3 feet high, the var. *γ* sometimes growing in water six feet deep, on the banks of Lake St. Clair etc., with generally slender, short branches, covered with small, crowded, heath-like foliage, and bearing tufts of flowers at the tops.—*Branches* covered with a pale brown bark. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ inch long, with two minute stipules at the base of the short petiole; narrow-linear, trigonous, variable in breadth, sharp or blunt; margins quite glabrous, or strongly ciliated with rigid hairs. *Flowers* rose-coloured, $\frac{1}{3}$ inch across, sessile in the axils of the leaves. *Calyx* enveloped at the base in two equitant bracts, its tube lengthened and filiform, bearing five broad subscarious lobes, that are suddenly contracted to hair-like points. *Petals* narrow-oblong. *Stamens* about twenty.—Gunn is inclined to consider that there are two species included under my var. α. one with erect branches, which has only been found on the South Esk River; the other with short, spreading branches; but these forms seem quite undistinguishable in the dried state; var. *β*, with slender, twiggy branches, looks to me much more distinct, as does var. *γ*, with very short, almost fasciculate, pubescent branches, and broader, strongly ciliated leaves: but Gunn considers these to be undoubted forms of the common *C. glabra*. I have ventured further to reduce Schauer's *M. Brownii* and *Baueri* to the same species, the characters he gives being, as far as I can judge, all to be found on Tasmanian specimens of this species.

Gen. II. THRYPTOMENE, *Endl.*

Calyx bibracteolatus, obconicus, supra ovarium non productus, limbi laciniis orbiculatis subpetaloideis. *Petala* 5, parva, orbiculata. *Stamina* 5–10, omnia fertilia; filamenta brevia; antheræ didymæ, loculis globosis, e connectivo glandula terminato pendulis. *Ovarium* 1-loculare. *Ovula* 2–4, e placenta basilari erecta, collateralia. *Stylus* brevissimus. *Capsula* obconica, abortu monosperma. *Semen* erectum. *Embryo* orthotropus.—Frutices; foliis *oppositis, exstipulatis;* floribus *subsessilibus, axillaribus*.

A small genus of Southern Australian shrubs.—*Leaves* small, opposite, exstipulate. *Flowers* also small, axillary, almost sessile. *Calyx* with two small bracteolæ at the base; tube obconic; limb of four, broad, subpetaloid

lobes. *Petals* minute, orbicular, sessile. *Stamens* five to ten, with short, incurved filaments, and pendulous, didymous anthers, with a gland at the back. *Ovary* one-celled, with two to four erect, collateral, basal ovules, a short style, and capitate stigma. *Fruit* not seen in the Tasmanian species; in the Australian, a one-seeded, obconic capsule. (Origin of name unknown to me.)

1. **Thryptomene micrantha** (Hook. fil. in Kew Journ. Bot. 1853, v. 299. t. viii.); glaberrima, foliis lineari-obovatis obtusis grosse punctatis, floribus subternis in pedunculo brevissimo sessilibus, petalis lobis calycinis minoribus, staminibus 5. (*Gunn*, 2042.)

Hab. Schouten Island, in Bass' Straits, on banks of sand and oyster-shells, *Gunn*.—(Fl. April.)

This differs from the described species of *Thryptomene* in having only five stamens.—A small, twiggy bush, with slender branchlets, covered with little opposite leaves, and bearing minute, axillary, white flowers. *Branchlets* obscurely four-angled, covered with pale bark. *Leaves* rather crowded, suberect or patent, $\frac{1}{4}$–$\frac{1}{3}$ inch long, thick and coriaceous, very shortly petioled, linear-obovate, blunt, covered with large dots. *Peduncles* very short, bearing one to three sessile flowers. *Calyx* 1 line long, obconic, ten-ribbed, with two minute deciduous bracts at the base; lobes five, orbicular. *Petals* smaller than the calyx-lobes, of the same form, white, persistent. *Stamens* five, with short, subulate, incurved filaments, and didymous anthers with a thickened connective; cells bursting transversely. *Style* short. *Ovary* elongate, with one small cell towards the top, containing two very minute collateral ovules, attached to a small placenta near the base of the cell.

Gen. III. MELALEUCA, *L.*

Flores sessiles, capitati v. spicati. *Calycis* tubus hemisphæricus; limbus 5-fidus. *Petala* 5, fauce calycis inserta. *Stamina* plurima; filamenta elongata, basi in phalanges 5 petalis oppositas coalita. *Ovarium* 3-loculare, loculis multiovulatis. *Capsula* calycis tubo basi cum ramo connato inclusa, apice trifariam dehiscens.—Folia *alterna v. opposita, exstipulata.*

A very large Australian genus, having a very few representatives in other countries, as *M. Cajuputi* (which yields the Cajeput oil), in the Malayan Archipelago. About 130 Australian species are known.—*Flowers* generally sessile, and often immersed in the substance of the branch, and visible within it, on a transverse section, at a very early age. *Calyx*-tube hemispherical; limb five-lobed. *Petals* five. *Stamens* united into five bundles opposite the petals, free above. *Fruit* connate with the branch, and hence persistent for many years, three-celled, with many small, angular seeds bursting above. (Name from μελας, *black*, and λευκος, *white*; in allusion to the contrast of the black trunk and white foliage of one of the first described species.)

1. **Melaleuca squamea** (Lab. Nov. Holl. ii. 28, t. 158); ramulis villosis, foliis alternis v. undique insertis patulis ovato-lanceolatis lineari-lanceolatisve pungentibus dorso 3–5-nerviis, capitulis terminalibus globosis basi villosis, phalangibus 5–9-andris, unguibus brevissimis.—*Br. in Hort. Kew.* iv. 412; *Bot. Reg. t.* 477; *De Cand. Prodr.* iii. 213. (*Gunn*, 682, 807.)

Hab. Very common in peaty soil in many parts of the Colony, ascending to 4500 feet.—(Fl. Dec.–Feb.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

A common and very variable plant; Mr. Gunn considers that there are possibly two species confounded under it, an alpine and lowland one, but I find no difference whatever between these, and he indicates none. Dr. Mueller sends some very interesting specimens from Victoria, showing, on the same specimen, broad-ovate, acuminate leaves, and narrow, linear-lanceolate ones; sometimes the whole of the branches, young shoots, leaves and all, are villous. —A very handsome shrub, 2–4 feet high. *Branchlets* villous. *Leaves* numerous, uniform in size, rigid, curved, patent, pungent, $\frac{1}{4}$–$\frac{1}{3}$ inch long, generally three-nerved, very variable in breadth. *Flowers* pale purple or white, forming terminal heads as large as a marble, which are very villous at the base.

2. **Melaleuca pustulata** (Hook. fil. in Lond. Journ. Bot. vi. 476); ramulis glabris albo-striatis novellis puberulis, foliis alternis erecto-patentibus crassis lineari-obovatis linearibusve obtusis supra planis subtus convexis glandulis grossis tuberculatis, capitulis terminalibus sphæricis, calyce glaberrimo, petalis flavis. (*Gunn*, 1069.)

Hab. Oyster Bay, on the east coast, and on a tributary of the South Esk, north-east of Campbell-town, about forty miles from Launceston, *Gunn*.

I have only three small specimens of this very distinct species.—A glabrous shrub, 5–6 feet high. *Branches* slender, covered with white bark. *Leaves* rather scattered, alternate, suberect, linear or narrow linear-oblong, blunt, concave above, convex at the back, with an obscure, thick midrib, and many tubercles caused by prominent glands. *Heads* of flowers terminal, small, ½ inch across, yellow. *Calyx* perfectly glabrous.

3. **Melaleuca ericæfolia** (Smith, Exot. Bot. i. 67. t. 34); ramulis glabris albo-lineatis, foliis ericoideis sparsis erecto-patentibus subrecurvis anguste linearibus obtusis superne concavis subtus convexis, capitulis oblongis terminalibus v. subterminalibus glaberrimis, phalangiis 8–10-andris.—*De Cand. Prodr.* iii. 213. M. nodosa, *Link, En. Hort. Berol.* ii. 273; *Sieb. Pl. Exsicc.* 318 *et* 549. M. Gunniana, *Schauer in Walp. Rep.* ii. 928. (*Gunn*, 18.)

Hab. Abundant, especially in swampy ground, in the northern parts of the Colony.—(Fl. Oct.–Dec.) (Colonial name, "Swamp Tea-tree.")

Distrib. South-eastern Australia and New South Wales. (Cultivated in England.)

Mr. Gunn describes this as one of the commonest inhabitants of the marshes, often forming an impenetrable scrub, most expensive to clear. Trees of it attain 70 feet, and 4–5 feet in girth: one which that naturalist has measured was unbranched for 27 feet, and was 5½ feet in girth at 3 feet above the ground. In poor sandy soil it forms a dwarf bush. Of the bark, he adds, the natives used to make the Catamarans, or canoes, so admirably figured in Labillardière's voyage, which were stitched with the bark of *Sida pulchella* and *Plagianthus sidoides*.—*Branches* covered with white bark, streaked with black lines, perfectly glabrous, as are the leaves. *Leaves* rigid, very narrow-linear, almost acicular, but blunt at the apex, alternate, somewhat recurved, ¼–½ inch long. *Flowers* sulphur-yellow, smelling sweet but heavily, in terminal cylindrical or oblong heads (sometimes with the branch produced beyond them), an inch or more long.

4. **Melaleuca squarrosa** (Smith, Linn. Trans. vi. 300); glaberrima v. ramulis villosis, foliis oppositis ovatis ovato-rotundatis ovato-cordatisve acuminatis subpetiolatis 5–7-nerviis, spicis cylindricis terminalibus, bracteis foliaceis, calycibus glabris, phalangibus sub-12-andris.—*Labill. Nov. Holl.* ii. 28. *t.* 169; *De Cand. Prodr.* iii. 215. M. myrtifolia, *Vent. Hort. Malm. t.* 47. (*Gunn*, 311.)

Hab. Abundant in moist sandy soil.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

A handsome, erect shrub, averaging 6–9 feet in height, but occasionally attaining 20 feet, *Gunn*.—Perfectly glabrous, or with the branchlets villous or pubescent. *Leaves* opposite, decussate, shortly petioled, nearly flat, ovate-acuminate or cordate or almost orbicular-ovate, 1⅓ inch long, with five to seven nerves. *Spikes* cylindrical, terminal, of numerous yellow flowers, each subtended by a bract, which is similar to, but smaller than, the cauline leaves.

5. **Melaleuca gibbosa** (Lab. Pl. Nov. Holl. ii. 30. t. 172); glaberrima, foliis oppositis ternisque obovatis valde concavis obtusis enerviis v. subtus trinerviis, spicis pauciflоris ramulis brevibus terminalibus, calycibus glabris, phalangiis polyandris, unguibus longitudine petalorum. — *De Cand. Prodr.* iii. 215. (*Gunn*, 105.)

Hab. Common in the northern parts of the Colony, near the sea, and in the interior.—(Fl. Sept.–Dec.)

Distrib. South-eastern Australia.

A very variable shrub, according to Gunn; forming a small scrubby bush near the sea and on poor sandy soil, and a fine bushy shrub, 6 feet high, on richer soil in the interior.—Everywhere perfectly glabrous. *Branches* slender, often spreading. *Leaves* opposite, rarely ternate, small, very variable in size, breadth, and amount of concavity, generally 3–4 lines long, sessile, obovate, blunt, appressed to the branch, which they partly embrace, at other times flatter, three-nerved on the back, shorter and spreading. *Flowers* in small heads, terminal or lateral, of a fine purple colour.

Obs. *Melaleuca fascicularis*, Lab. Nov. Holl. ii. 29, 170 (*Astartea fascicularis*, DC. Prodr. iii. 210), stated by Labillardière to have been found in Tasmania, is not so, but a native of South-western Australia.

Gen. IV. KUNZEA, *Reichb.*

Flores plerumque pedicellati, bibracteolati. *Calycis* tubus campanulatus, inferne cum ovario connatus; limbus 5-fidus. *Petala* 5, annulo calycino inserta. *Stamina* 20–100; filamenta libera, elongata. *Ovarium* ½-inferum, 2–3-loculare, loculis multiovulatis. *Capsula* intra calycis tubum coriaceum inclusa, apice loculicide dehiscens. *Semina* plurima.—Frutices; foliis *alternis;* floribus *axillaribus terminalibusque.*

A small Australian genus, containing about fifteen species.—*Shrubs* with alternate, exstipulate leaves. *Flowers* pedicelled, axillary or terminal, often panicled or subcapitate. *Calyx*-tube bell-shaped, with a five-lobed limb. *Stamens* placed on a ring in the mouth of the calyx, very numerous; filaments free. *Ovary* attached by its lower part only to the calyx, two- or three-celled; cells many-ovuled. *Capsule* enclosed within the coriaceous tube of the calyx, with a loculicidal dehiscence. (Name in honour of *Gustav Kunze*, a German cryptogamic botanist.)

1. **Kunzea corifolia** (Reichb. Consp. Reg. Veg. 175); glaberrima v. ramulis puberulis, foliis alternis fasciculatis imbricatisve linearibus subacutis strictis recurvisve, floribus axillaribus, calycibus glabriusculis lobis lanceolatis, stigmate capitato, capsula 3-loculari.—*Schauer in Plant. Preiss.* i. 124. Metrosideros corifolia, *Vent. Malm. t.* 46; *De Cand. Prodr.* iii. 225. Leptospermum ambiguum, *Smith, Exot. Bot. t.* 59. (*Gunn*, 488.)

Hab. Gun-carriage Island, and on granite hills in Flinders' Island, *Backhouse, Gunn.*—(Fl. Nov., Dec.)

Distrib. South-eastern Australia. (Cultivated in England.)

A shrub 9–12 feet high.—*Branches* glabrous, the ultimate often pubescent. *Leaves* imbricate or fascicled, on short, lateral branches, linear or linear-lanceolate, sharp or blunt, nerveless, ⅓–½ inch long. *Flowers* numerous in the axils of the upper leaves along the lateral branches, hence often appearing to form elongated, interrupted spikes. *Flowers* shortly pedicelled. *Calyx* somewhat pilose, its lobes spreading, lanceolate. *Petals* small, white or yellowish.

Gen. V. CALLISTEMON, *Br.*

Flores sessiles, spicati. *Calycis* tubus hemisphæricus, cum ovario connatus, limbo 5-lobo. *Petala* 5. *Stamina* plurima; filamenta libera, elongata. *Ovarium* adnatum, 3–5-loculare. *Capsula* calycis tubo lignoso cum ramo connato inclusa, apice 3–5-fariam dehiscens.—Frutices; foliis *exstipulatis, alternis.*

The species of this genus are confined to Australia and Tasmania; about fifteen are known. It is nearly allied to *Melaleuca* in the adnate ovary and sessile calyx, which becomes indurated and connate with the branch, but differs in the free filaments. The inflorescence forms spikes in the middle of the branches, and in young branches of some species the flowers may be detected immersed in the wood of the branch for many months before they burst through. (Name from καλλιστος, *most beautiful*, and στημων, *a stamen.*)

1. **Callistemon viridiflorum** (DC. Prodr. iii. 223); foliis lineari-lanceolatis rigidis pungentibus (1 unc. longis), calycibus glabris.—Metrosideros viridiflora, *Sims, Bot. Mag. t.* 2602. (*Gunn,* 487.)

Hab. Most abundant in the interior and northern parts of the Colony, often growing in swampy ground, ascending to 4000 feet.—(Fl. Jan.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

A very variable plant according to Gunn, inhabiting many situations wet and dry, at times even growing in water six feet deep in Lake St. Clair, as *Calycothrix* does. A shrub varying from 1–6 feet high.—*Leaves* very close set, almost imbricating, very rigid, narrow lanceolate, acuminate, pungent, 1 inch long or less. *Flower-spikes* 2–4 inches long. *Calyx* quite glabrous. *Filaments* very long, yellow-green.

2. **Callistemon salignum** (DC. Prodr. iii. 223); foliis anguste lineari-lanceolatis acuminatis mucronatis medio penninerviis (2–4 unc. longis).—C. lophanthum, *Sweet, Fl. Austral. t.* 29. Metrosideros saligna, *Sm. Linn. Trans.* iii. 272; *Sims, Bot. Mag. t.* 1821; *Vent. Hort. Cels. t.* 70; *Bonpl. Nov. t.* 4; *Sieb. Plant. Exsicc. n.* 320. (*Gunn,* 17.)

Hab. Abundant on river-banks in all parts of the Colony.—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

At first sight this does not appear to differ much from *C. viridiflorum*, but it is quite a distinct species, having much larger and less rigid leaves, with shorter stamens. Planchon (Herb. Hook.) doubts if the Tasmanian plant be the same as Smith's and Sims' Australian one, but I find no difference between them, except that the calyces of the former are sometimes but not always hairy, and the leaves are hardly so long.

Gen. V. EUCALYPTUS, *L'Hér.*

Calycis tubus obovatus, globosus, obconicus v. ampullaceus, cupulæformis; limbus operculiformis, integer, basi regulariter circumscisse dehiscens, deciduus. *Petala* 0 v. cum operculo calycino conereta. *Stamina* numerosa, libera. *Capsula* 3–4-locularis, calyce lignoso inclusa, apice valvis 3–5 dehiscens, polysperma.—Arbores; foliis *plantis junioribus oppositis, rarius in adultis oppositis, coriaceis, plerumque obliquis;* petiolo *dum adest sæpissime subtorto;* inflorescentia *corymbosa v. umbellata.*

The Gum-trees form one of the largest and most important genera of plants in Australia, and that which contains by far the greater number of forest-trees. They abound in all parts of the continent and in Tasmania, fully 130 species being known, of which 50 are confined to South-western Australia, 60 to South-eastern Australia, and 20 are tropical species. It is most remarkable that, with the exception of a Timor and a few Molucca Island species, none have been found elsewhere but in Australia.

The species are extremely difficult of discrimination, nor can they be properly determined from dried specimens, important characters residing in habit, the bark, etc. I attempted when in Tasmania to fix upon the characters of the species that I met with growing there, but I am indebted to Mr. Gunn's valuable notes and information for far better materials than I could collect myself. Notwithstanding all these advantages, I am much puzzled as to the limits of several of the species, and can only offer the following monograph of the Tasmanian ones as an attempt. I think I have kept separate, as species, quite as many forms as are really so, perhaps more, and it is very possible that if they were properly studied they would prove much less numerous; but for this purpose it is requisite that the naturalist should have no preconceived ideas of what is to form a species, and especially that he study the individuals in all soils and situations, cultivate long, and propagate them in cultivation. It is quite certain that all or most of the species have very different aspects at different periods of growth; and as each aspect is liable to be modified by soil and climate, the limits of variation must be very wide. Local circumstances may further favour the prolongation or retardation of that period during which an individual or group of individuals retains a certain form or aspect, and thus occasion two or more contemporaneous forms of one species to

look very different from one another. To study the "Gum-trees" well, it is further necessary to study the other plants of the Colony, for the results of an observer's experience in such a genus will be entitled to more or less weight very much according to the amount of knowledge he possesses of the limits of variation, etc., in other plants: in short, it requires an experienced and very cautious observer to monograph the Australian Gum-trees, for it is no doubt one of the most difficult tasks in all systematic botany, and at the same time one of the most important in an economic as well as in a scientific point of view.

Of the economic value of the Gum-tree timbers I regret to say that I have little definite information, owing to the difficulty of ascertaining the precise species upon which observations have been made and published. In the Proceedings of the Royal Society of Tasmania I find some very valuable notices by Messrs. Milligan, Mitchell, Watson, Hull, and Ewing, respecting the Blue Gum, Swamp Gum, Stringy Bark, Peppermint Gum, Myrtle-leaved Gum, Ash Gum, Iron-wood, Mountain Gum, Weeping Gum, Black-but Gum, and White Gum. Of these the Blue Gum is no doubt *E. Globulus*, a rapid-growing tree, with excellent wood, attaining a gigantic size both in Southern Australia and Tasmania. The Swamp Gum and Stringy Bark are perhaps both referable to my *E. gigantea*, under which two species may be confounded by me, or the Swamp Gum may be some other species attaining a gigantic size in damp hollows. Mr. Mitchell describes the Swamp Gum as so very like the *E. Globulus* as not to be easily distinguished, but with smaller leaves and thinner bark, as being the largest of the genus, and growing twice as fast as *E. Globulus;* he mentions trees 251 feet to the first branch. The Stringy Bark he distinguishes by its much thicker, fibrous bark; Mr. Milligan however adds in a note that this Stringy Bark is the most gigantic of all, that it is well named *gigantea* by me, and that he has measured a *sound* trunk 64 feet in girth at 4 feet above the ground, and 200 feet high to where it was broken off, and containing 200 tons of timber. Mr. Watson adds that the wood of *E. Globulus* is equal to English Oak in density, and superior on account of the great length attainable, whereas the Stringy Bark is not approved for shipbuilding, because it shrinks and swells with variations of humidity. Mr. Hull mentions a hollow *E. Globulus* at Tolosa as 84 feet in circumference at the ground, and 78 at 6 feet above the ground, its estimated height being 330 feet. Lastly, the Rev. Mr. Ewing gives details of a Swamp Gum-tree, also hollow, found near Hobarton, which was 130 feet in circumference at the ground, and 102 at 3 feet above it.

I have preferred giving these data here to placing them under the supposed species to which they refer, and would earnestly recommend that in all cases of observations or experiments being made on these and other trees, specimens of leaves and flowers and fruit be dried between papers, accurately ticketed, and deposited in the Museum of the Society at Hobarton, and, if supposed to be unknown or undescribed, figured in the Royal Society's Proceedings.

The genus *Eucalyptus* is at once recognized by its cup-shaped calyx of various forms, crowned with a deciduous operculum (which assumes also many forms), and which consists of the combined calyx and corolla. A fringe of free stamens crowns the mouth of the calyx, and the fruit is a three- to five-celled woody capsule, bursting by short valves usually within the mouth of the calyx, and containing numerous small seeds. The leaves are invariably opposite in the young plant, but are very rarely so in the old one; when alternate, their surfaces are mostly quite similar, and the petiole is half twisted, so that the plane of the leaf is parallel to the axis of the tree. (Name from ευ, *well*, and καλυπτω, *to cover;* in allusion to the operculum.)

§ 1. *Leaves opposite at all periods of growth.*

1. **Eucalyptus cordata** (Lab. Nov. Holl. ii. 13. t. 152); foliis glaucis plerisque oppositis sessilibus late cordatis crenulatis, ramulis teretibus novellis tetragonis, floribus 3–4 pedunculo brevissimo sessilibus, operculo depresso cupula subglobosa breviore.—*De Cand. Prodr.* iii. 221. (*Gunn*, 1071.)

Hab. Recherche Bay and Huon River, *Labillardière, Gunn.*—(Fl. Oct.) (Cultivated in England.)

A small tree, very confined in its locality, easily recognized by its sessile, opposite, broadly cordate, blunt or apiculate, crenate leaves, that are bilobed at the base.—*Flowers* generally in threes, almost sessile. *Calyx* obconic when young, almost globose in fruit. *Operculum* short and broad.

2. **Eucalyptus Risdoni** (Hook. fil. Lond. Journ. Bot. vi. 476); foliis oppositis connatisve ovato-cordatis triangulari-ovatisve acutis, pedunculis teretibus 3–8-floris, floribus parvis pedicellatis, calyce subelongato, operculo brevi depresso, capsula parva obovato-obconica, ore depresso margine lato, valvis parvis immersis. (*Gunn*, 1072.)

Hab. Banks of the Derwent below Risdon, *Gunn.*—(Fl. Nov.) (*v. v.*)

A small, glaucous, bushy tree, 8–12 feet high, branching from the base, of which Mr. Gunn and I found a single clump on the flanks of a valley close to the Derwent, a few miles above Hobarton, but on the opposite side of the river; its locality was circumscribed to a very few acres. It is allied to the *E. pulverulenta* of New South Wales.—*Bark* smooth. *Branches* terete, slender. *Leaves* opposite, free or connate at the base, when free cordate, ovate or triangular-ovate, very acute. *Flowers* three to eight, pedicelled, on a slender peduncle ½ inch long, small. *Operculum* depressed, shorter than the obovate or obconic capsule.—Plate XXIV. Fig. 1, calyx with the operculum and stamens removed, *magnified*.

§ 2. *Leaves alternate in old trees.*

a. Calyx and fruit distinctly angled, or with prominent ridges.

3. **Eucalyptus Globulus** (Lab. Voy. i. 153, t. 13); ramulis angulatis, foliis petiolatis falcatis e basi rotundata v. cuneata sensim elongato-lanceolatis acuminatis, floribus solitariis ternisve sessilibus v. breve pedunculatis, calyce obconico crasso 4-gono tuberculato, operculo tuberculato calyce æquilongo sed latiore tuberculato apice mamilla crassa, capsula ore latissimo plano infra os valde constricto, valvis immersis parvis.—*Lab. Nov. Holl.* ii. 121; *De Cand. Prodr.* iii. 220. (*Gunn*, 1070.)

Hab. Flinders' Island, in Bass' Straits; southern parts of Tasmania, from forty miles north of Hobarton to the extreme south, abundant, *Labillardière, etc.*—(Fl. Nov., Dec.) (*v. v.*) (Blue Gum.)

Distrib. South-east extremity of Australia, from Victoria and Mount Buller to Wilson's Promontory. (Cultivated in England.)

A very fine tree, conspicuous for its large leaves and flowers, rapid growth, and powerful, almost offensive odour, when crushed. Gunn remarks that though abundant in South-east Australia, and even in Flinders' Island, it is nowhere found in Tasmania except to the southward of sixty miles south of Launceston.—A tree 150 feet high. *Young plants* with very glaucous, opposite, broadly cordate, sessile leaves. *Old plants*:—*Branchlets* angled. *Leaves* petioled, a span or more long, and 1 inch broad at the base, falcate, gradually tapering to an acuminate point. *Flowers* sessile in the axils of the leaves, solitary or two or three together, shortly peduncled, very variable in size, rugose. *Calyx* four-angled, obconic. *Capsule* very woody, ¾ inch broad, obconic, deeply constricted below the top, with a very broad, flat, smooth mouth, and four or five small, sessile valves.—Mueller sends specimens from Gipps' Land with very small, smooth flowers and capsules; it is his var. γ. *coronifera* (Hb. Hook.).

4. **Eucalyptus coccifera** (Hook. fil. Lond. Journ. Bot. vi. 477); ramis ramulisque teretibus lævibus, foliis alternis (parvis) uniformibus ellipticis v. anguste lanceolatis lineari-lanceolatisve utrinque attenuatis mucrone uncinato, pedunculis brevibus 3–8-floris, calycibus rugosis ancipitibus v. tetragonis, operculo calyce breviore et latiore rugoso centro depresso, capsula crassa late obconica ore lato plano intra marginem canaliculato, valvis 4 immersis.—*Hook. Bot. Mag. t.* 4637. (*Gunn*, 411, 1076, 1964.) (Tab. XXV.)

Hab. Tops of all the mountains, elev. 3–4000 feet, *Lawrence, Gunn, etc.*—(Fl. Dec., Jan.) (*v. v.*) (Cultivated in England.)

A small tree, 5–15 feet high, generally very glaucous.—*Leaves* petioled, alternate, 2–3 inches long, narrow-elliptic, elliptic-lanceolate, or very narrow-lanceolate, with a deciduous, hooked, acuminate apex. *Peduncles* stout, three- to eight-flowered. *Calyx* obconic, shortly pedicelled, rugose. *Operculum* very much depressed, broad, shorter than the calyx, rugose. *Capsule* four-angled, angles sometimes indistinct, or with two distinct ridges that sometimes

vanish above the middle, broadly obconic, with a very broad, flat, smooth mouth, grooved round the circumference; valves four, small.—PLATE XXV. Fig. 1, fruiting branch, *natural size;* 2, calyx, *magnified.*

β. Calyx and fruit not angled.

† *Calyx urn-shaped.*

5. **Eucalyptus urnigera** (Hook. fil. Lond. Journ. Bot. vi. 477); ramis ramulisque teretibus, foliis forma proteis sublonge petiolatis ovatis lanceolatis lineari-lanceolatisve in apicem plerumque obtusum angustatis, pedunculis elongatis 3-floris, floribus longe pedicellatis, calycibus cylindrico-urceolatis ore campanulato, operculo depresso lato umbonato v. mamillato, capsula urceolata ore crasso magno, valvis profunde immersis. (*Gunn,* 1074.) (TAB. XXVI.)

HAB. Alpine districts, not uncommon on the summit of Mount Wellington, Lake Echo, etc., *Gunn.* —(Fl. Dec.) (*v. v.*) (Cultivated in England.)

A small tree, 15–20 feet high, with spreading branches and drooping, red-brown branchlets. *Leaves* extremely variable in size and shape, 1–4 inches long, generally shining, from ovate or elliptic and straight to narrow, linear-lanceolate and falcate; apex with a short, hooked, deciduous mucro; petioles almost an inch long. *Flowers* $\frac{1}{3}$–$\frac{3}{4}$ inch long, in threes, with long pedicels at the apex of a long peduncle. *Calyx* extremely variable in breadth (rarely globose), swollen below, then contracted and expanding again at the mouth, which is thick, and not plane. *Operculum* short, broad, often with a mamilla, but sometimes sunk in the middle. *Fruit* sometimes an inch long; valves sunk far below the mouth, placed at the contraction.—Upon this species a species of *Coccus* abounds, which yields a bright-red colouring matter, which may be of use in the arts: the fact was first noticed by Mr. Lawrence, who had commenced experiments upon the subject, that were frustrated by his lamented death.—PLATE XXVI. Fig. 1, branch with ripe fruit, *of the natural size;* 2, calyx of flower, *magnified.*

†† *Calyx turbinate, obconic or obovate. Peduncles generally three-flowered* (*in* E. Acervula *four- to eight-flowered*).

6. **Eucalyptus viminalis** (Lab. Nov. Holl. ii. 12, t. 151); ramis ramulisque teretibus, foliis petiolatis anguste lanceolatis longe acuminatis falcatis, pedunculis petiolo brevioribus 3–4-floris, floribus subsessilibus, calycibus obconicis, operculo conico v. subhemisphærico calyce æquilongo, capsulis parvis subglobosis, valvis exsertis porrectis majusculis erectis triangularibus.—*De Cand. Prodr.* iii. 218. (*Gunn,* 685, 1083, 1085, 1090, 1092.)

HAB. Abundant throughout the Colony, ascending to 4000 feet, *Labillardière, etc.*—(Fl. Nov.) (*v. v.*)

DISTRIB. South-eastern Australia.

This is one of the commonest Tasmanian species, and forms a middling-sized tree 60 feet high, with a twisted trunk of 3–5 feet in girth, flaking bark, and pendulous branchlets. *Leaves* petioled, a span and more long, slightly falcate, always very narrow, and tapering into a long, acuminate point. *Peduncles* shorter than the petioles, bearing three, rarely four or more flowers. *Flowers* small, pedicelled. *Calyx* obconic, smooth. *Operculum* conical or hemispherical, blunt or sharp, as long as the calyx. *Capsule* almost globose, size of a peppercorn, with a straight, polished, erect band round the top, from which the four prominent, triangular, woody valves rise.—Australian specimens have often more than three flowers on each peduncle.

7. **Eucalyptus Gunnii** (Hook. fil. Lond. Journ. Bot. iii. 499); arbor parva, ramulis floribusque glaucis, foliis alternis petiolatis ellipticis ovatis oblongis lanceolatisve acutis acuminatis mucronatisve, pedunculis 3-floris petiolo subæquilongis, calycibus turbinatis breviter pedicellatis, operculo latiusculo conico acuto calyce subbreviore, capsula obovato-oblonga ore non incrassato, valvis immersis. (*Gunn,* 1080, 1082, 1084, 1963.) (TAB. XXVII.)

Hab. Abundant in alpine districts, elev. 3–4000 feet, often forming small forests in marshy places, etc., *Gunn, etc.*—(Fl. Nov.) (*v. v.*) (Cider-tree.)

Distrib. Alps of South-western Australia, *Mueller*.

A very common but singularly variable small tree, 20–30 feet high, sparingly, irregularly branched, with smooth bark and glaucous foliage, becoming shining in old plants. Sometimes however solitary trees may be found of much greater size, and so like *E. viminalis* that without fruit it is difficult to distinguish it from an alpine form of that species.—*Leaves* seldom above 2 inches long, of all shapes, from oblong or almost orbicular to narrow-lanceolate, petioled, very coriaceous. *Peduncles* about as long as the petioles, three-flowered. *Calyx* obconic, sessile or shortly pedicelled, sometimes obscurely constricted above the middle, and approaching *E. urnigera* in form. *Operculum* almost as long as the calyx, broader than it, conical, sharp. *Capsule* size of a pea, obovate-oblong or obovate-obconic, terete, with a narrow, not thickened mouth, and valves sunk below its rim.—This well-known tree yields the cider of Tasmania, which flows in spring from incisions in the trunk.—Plate XXVII. Fig. 1, flowering branch; 2, calyx, *magnified*.

8. **Eucalyptus Acervula** (Sieber, Pl. Exsicc. 469); arbor elata, ramulis robustis pendulis, foliis ovato- v. elliptico-lanceolatis acuminatis coriaceis subnitidis rectis falcatisve nervis divergentibus, pedunculis elongatis petiolis brevioribus 4–8-floris, calycibus obconicis crasse pedicellatis, operculo conico calyce aequilongo, capsulis obconicis ore plano dilatato latiusculo, valvis immersis.—*De Cand. Prodr.* iii. 217. (*Gunn*, 1297, 1081, 1088, 1093.)

Hab. Abundant in many parts of the Colony, as on the Derwent from Hobarton to Bothwell, Launceston, etc.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia.

This appears to be a very constant species, all my specimens, which are very numerous, and many individuals being very similar; it is most nearly allied to *E. viminalis* in the flowers, but differs in the sunk valves of the capsule, and leaves; the foliage is that of *E. Gunnii*, but the peduncles are always more than three-flowered, and the capsule is different.—*Trunk* erect, often lofty; bark smooth or rough, pale or brown. *Branches* more or less pendulous. *Leaves* 2–4 inches long, ovate-lanceolate or elliptical-lanceolate. *Peduncles* stout. *Flowers* four to eight.—The bruised foliage has a much sweeter odour than is usual in the genus,—in Hobarton specimens, at any rate.

9. **Eucalyptus vernicosa** (Hook. fil. Lond. Journ. Bot. vi. 478); arbuscula glaberrima vernicosa nitida, ramis ramulisque erectis robustis, foliis parvis erectis breve petiolatis exacte oblongis ellipticis rotundatisve apiculatis crassissime coriaceis, pedunculis crassis brevissimis 1–3-floris, calyce late obconico v. oblongo operculum conico-hemisphæricum subrostellatum æquante, capsula hemisphærica ore non contracto plano v. depresso. (*Gunn*, 1113.)

Hab. Summit of Mount Fatigue, elev. 4000 feet, *Milligan, Gunn*.—(Fl. April.)

A very peculiar and most distinct form, perhaps the smallest of the whole genus, quite unlike any other Tasmanian one, though, all the specimens being from but one locality, some allowance must be made for deviations from the description. Gunn describes it as forming a bush 1–4 feet high, though he suspects that some trees of 15 feet, which he saw in rocky, sheltered places, may be the same.—*Branches* very stout, erect, covered with dark, red-brown, rough bark; branchlets angled. *Leaves* erect, ½–1½ inch long, excessively thick and coriaceous, shining as if varnished on both surfaces, oblong or elliptical or orbicular, apiculate, petioled. *Peduncles* very short and thick, one- to three-flowered. *Calyx* oblong or obconic, with a broad, conical, almost rostrate operculum. *Peduncles* generally many-flowered. *Operculum* considerably shorter than the calyx.

10. **Eucalyptus amygdalina** (Lab. Nov. Holl. ii. 14. t. 154); ramulis gracillimis, foliis gracile petiolatis anguste linearibus lineari-lanceolatis longe acuminatis rectis falcatisve 1-nerviis, pedunculis folio

longioribus æquilongisve 3–8-floris, floribus pedicellatis, calyce elongato, operculo brevissimo, capsulis parvis subglobosis ore contracto plano v. depresso, valvis immersis.—*De Cand. Prodr.* iii. 219; *Bot. Mag. t.* 3260. (*Gunn*, 25, 1079.)

Hab. Abundant throughout the Island. "Peppermint Gum."—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia. (Cultivated in England.)

Usually a small tree, but sometimes attaining a great height; the wood is used for splitting and sawing, but will hardly burn at all.—*Bark* not deciduous, a character remarked by Gunn as accompanying that of throwing out shoots from the old stumps when cut down. *Branches* very slender. *Leaves* on slender petioles, 2–4 inches long, very narrow-lanceolate or absolutely linear, acuminate, one-nerved, not polished. *Peduncles* slender, many-flowered; pedicels also slender. *Calyx* elongated; operculum very flat. *Capsule* as large as a small pea, pedicelled, nearly globose, the mouth generally with a narrow border, but sometimes broad and flat; valves sunk.

11. **Eucalyptus coriacea** (A. Cunn. MSS., Schauer in Walp. Rep. ii. 925); arbor elata, ramulis pendulis, foliis coriaceis vernicosis valide petiolatis anguste lanceolatis acuminatis falcatis multinerviis, nervis subparallelis, pedunculis lignosis crassis (rarius gracilibus) 10–40-floris, floribus subcapitatis valide pedicellatis, calyce obconico, operculo hemisphærico v. subrostrato, capsulis magnis lignosis brevissime crasse pedicellatis hemisphæricis subglobosisve ore plano subcontracto, valvis vix immersis.—E. pauciflora, *Sieb. Pl. Exsicc. p.* 470. E. piperita, *var.* pauciflora, *De Cand. Prodr.* iii. 219. (*Gunn*, 684, 1107, 1108.)

Variat insigniter longitudine pedunculorum et pedicellorum, floribus crassis gracilibusve, calyce interdum compresso, et capsularum numero forma et magnitudine.

Hab. Abundant in most parts of the Colony, especially on the banks of the Derwent, from Hobarton to New Norfolk, at Formosa, Norfolk Plains, etc.—(Fl. Oct., Nov.) (*v. v.*) "Weeping Gum."

Distrib. South-eastern Australia.

A very common and variable tree, 40–50 feet high, with generally spreading limbs, and weeping branches and branchlets, that hang down 10–12 feet. I have satisfied myself by specimens from the same individual, that little dependence can be placed upon any characters taken from the flowers and fruit; young, strong shoots bear vast numbers of stout, many-flowered, short peduncles, with numerous, crowded, thick-pedicelled, glaucous flowers; whilst more slender, older branches bear slender peduncles, with many long, slender flowers, not glaucous, and which apparently never come to perfection. The fruit varies extremely in size, from $\frac{1}{3}$–$\frac{1}{2}$ inch long, is generally very woody, nearly globular, on a stout pedicel, with a narrow or broad flat margin at the mouth, and somewhat sunk valves. The leaves afford the best character, being always lanceolate, falcate, very coriaceous, varnished, and have many parallel veins; they are 4–6 inches long, and have long, stout petioles. Gunn remarks of northern specimens that the bark is white or grey, and the wood very brittle.

12. **Eucalyptus gigantea** (Hook. fil. Lond. Journ. Bot. vi. 479); arbor gigantea, ramulis gracilibus pendulis, foliis amplis gracile petiolatis e basi ovata lanceolatis sensim acuminatis opacis basi valde inæquilateris costa distincta nervis divergentibus, pedicellis elongatis multifloris, calycibus subclavatis pedicellatis, operculo breviter hemisphærico obtuso v. subacuto, capsula majuscula pedicellata turbinata obconica hemisphærica v. subglobosa lignosa ore subcontracto intus plano v. abrupte depresso, valvis inclusis. (*Gunn*, 1095, 1104, 1106, 1965, 1966.) (Tab. XXVIII.)

Hab. Abundant in most parts of the Island, forming a great proportion of the hill-forests, ascending to 4000 feet.—(Fl. Oct.–Dec.) (*v. v.*) "Stringy-bark Gum."

Distrib. South-eastern Australia.

This forms a gigantic tree, specimens having been felled in the valleys at the base of Mount Wellington, 300 feet high and 100 feet in girth, of which a full account is given in the 'Proceedings of the Royal Society of Tas-

mania.' It is also a most abundant species, and forms the bulk of the forests of the elevated table-land of the interior and flanks of the southern mountains. It is difficult so to define its characters that it shall be recognized by them, but it is a well-known and readily distinguished species in the forest. At all periods of growth it has a tall, straight trunk, and few terminal branches, never very leafy or umbrageous. In some varieties the young branches have a fine glaucous-purple bloom on them, especially in alpine localities; such is the case with Mr. Gunn's No. 1095, from the banks of Lake St. Clair, where it forms a forest on one side of the Lake only, to the exclusion of all other timber.—*Bark* flaking off in stringy masses, used formerly by the natives for huts, canoes, etc. *Branchlets* slender, pendulous. *Leaves* broader than in most other species of this section, 4–7 inches long, ovate at the broad oblique base, then lanceolate and tapering to an acuminate point, surface not polished; nerves diverging. *Peduncles*, *flower*, and *fruit* so variable, that it is difficult to characterize them; usually the peduncles are stout, woody, as long as the petioles; the flowers very numerous, and forming a capitate head; the pedicels stout; calyx turbinate; operculum hemispherical. *Capsule* woody, gradually or suddenly contracted at the pedicel, spherical or oblong, obconic, with a contracted, not thickened, mouth, and sunk valves.—As in the other species, I have found very great differences in the flowers and fruits from upper and lower, older and younger, slender and stout branches.—PLATE XXVIII. Fig. 1, fruit, *nat. size;* 2, calyx, *magnified.*

13. **Eucalyptus radiata** (Sieb. Pl. Exsicc. p. 475); arbor mediocris, ramulis gracilibus sæpe pendulis, foliis anguste ellipticis lanceolatisve mediocribus vix nitidis 1-nerviis rectis falcatisve, pedunculis subelongatis multifloris, floribus pedicellatis, calyce obconico v. clavato, operculo brevi, capsula pedicellata.

Variat insigniter—

1. foliis lineari-elongatis, fructibus latioribus quam longis subturbinatis, ore dilatato plano.—Ad *E. amygdalinam* tendens. (*Gunn*, 1073, 1077, 1102.)

2. foliis elongatis lanceolatis, capsulis turbinatis longioribus quam latis, ore contracto. (*Gunn*, 1112.)

3. foliis ovato-lanceolatis elliptico-lanceolatisve, capsulis majusculis turbinatis.—Arbor elata, ad *E. giganteam* tendens.

4. foliis majoribus lanceolatis nitidis, capsulis ut in forma 3.—Arbor mediocris, ad *E. coriaceam* tendens. (*Gunn*, 1100, 1110.)

5. foliis angustis elongatis, capsulis parvis obconicis.—Arbor elata, ad *E. nitidam* tendens.

HAB. Very abundant in the southern parts of the Colony: 1, 2, and 4, Hobarton, etc.; 3, River Derwent at Cluny, Mount Wellington, elev. 2500 feet, Lake Echo, elev. 3000 feet; 5, Port Arthur, near the sea.—(Fl. Oct.–Dec.) (*v. v.*)

DISTRIB. South-eastern Australia.

A very common plant; as above characterized it may perhaps include several species, and, amongst others, varieties of *amygdalina*. The forms I have enumerated are probably not all of them varieties, in the correct sense of the term, but only states of one or more varieties, and, in some cases, of one individual, but it is quite impossible to unravel them.—A small or lofty tree, with a straight trunk, sometimes with a smooth and sometimes a flaking or almost stringy bark. *Branches* more or less weeping. *Leaves* usually shining, rather small, seldom 3 inches long, with one midrib, and very inconspicuous lateral veins, or none, narrow, sometimes very much so, though not so narrow as *E. amygdalina* usually has them. *Flowers* and *capsules* always pedicelled, the latter turbinate or obconic, rather large.

14. **Eucalyptus nitida** (Hook. fil.); arbor mediocris, ramulis pendulis, foliis anguste lanceolatis longe acuminatis coriaceis nitidis vernicosis nervis divergentibus, pedunculis validis multifloris, floribus brevibus subsessilibus, calyce breviter clavato v. obconico, operculo brevi lato, capsulis sessilibus parvis subglobosis ore contracto v. subdilatato, marginibus crassis planis angustisve. (TAB. XXIX.) (*Gunn*, 808.)

Hab. Hobarton, Circular Head, Currie's River, east of Georgetown, *A. Cunningham, Gunn.*—(Fl. Oct.) (*v. v.*)

I have great doubts as to the distinctness of this species, which I have at one time been inclined to refer to *E. amygdalina*, and at others to *E. radiata*, but from both of which it differs in the very small, sessile fruit, and very shining, coriaceous leaves. Gunn says, that at Currie's River it forms a bush only 5 feet high, and that at Circular Head it grows 10–20 feet high, and appears more of a shrub than a tree. It approaches *E. stellulata*, Sieber, in many points, but wants the three parallel nerves of that plant, and the large operculum.—Plate XXIX. Fig. 1 and 2, ripe fruit, *nat. size;* 3, calyx, *magnified.*

Gen. VI. LEPTOSPERMUM, *Forst.*

Flores sparsi, axillares. *Calycis* tubus campanulatus, cum ovario connatus, limbus superus v. ½-superus, sæpissime deciduus, lobis 5, valvatis. *Petala* 5, orbiculata. *Stamina* 20–60; filamenta brevia, libera. *Ovarium* 4–5-loculare, loculis multiovulatis. *Capsula* apice loculicide dehiscens.—Arbores *v.* frutices; foliis *alternis, exstipulatis;* floribus *albis.*

One of the most difficult genera in the Order, on account of the excessive variability of its species, whether in Australia, where thirty are known, or in New Zealand, where only two have been detected. The genus is almost confined to these two countries, a few species only having been found in Java, Borneo, and the Molucca Islands, accompanying various other types of Australian vegetation. Schauer's divisions of the genus into those with caducous and persistent calyx-lobes, are not available for the Tasmanian species, all of which have lobes which fall away at very variable periods, but always before the fruit ripens. Of the Tasmanian species, *L. scoparium* is very distinct; *L. myrtifolium* and *L. rupestre* are probably varieties of one, and many states of them are hardly distinguishable, when dry, from *L. nitidum; L. nitidum*, *pubescens*, and *flavescens*, all pass into one another, and are probably states of one variable species.—Trees or shrubs, with alternate, exstipulate leaves, and white flowers, of the same structure as those of *Callistemon*, but axillary, scattered, and the stamens have short filaments, and the calyx-lobes are valvate. (Name from λεπτος, *slender*, and σπερμα, *a seed.*)

1. **Leptospermum scoparium** (Smith, Linn. Trans. iii. 262); erectum, ramulis angulatis foliisque novellis sericeis, foliis brevissime petiolatis patulis recurvisve rigidis late ovatis ellipticis lanceolatisve acuminatis pungentibus concavis enerviis, floribus sessilibus axillaribus v. ramulis brevissimis terminalibus, calyce brevi turbinato glabro lobis deciduis rotundatis, capsula lignosa calyce semi-immersa apice 5-valvi. —*DC. Prodr.* iii. 227; *Schauer in Linnæa*, xv. 424; *Fl. N. Zeal.* i. 69. L. grandiflorum, *Hook. Bot. Mag. t.* 3419. Philadelphus scoparius, *Ait. Hort. Kew. ed.* 1. ii. 156. Melaleuca scoparia, *Forst. Prodr.* 240.

Var. *a. scoparia;* erecta, foliis lanceolatis. (*Gunn*, 486, 814.)

Var. *β. linifolia* (DC. l. c.); erecta, foliis anguste lineari-lanceolatis.—L. squarrosum, *Gærtn. Fruct.* i. 174; *Sieb. Pl. Exsicc. p.* 311. M. scoparia diosmatifolia, *Wendl. l. c. f.* 1. (*Gunn*, 486, 811.)

Var. *γ. myrtifolia* (DC. l. c.); erecta, foliis elliptico-ovatis rotundatisve.—*Wendl. l. c.* Philadelphus floribundus, *Rœm. et Ust. Mag.* 7. *t.* 2. (*Gunn*, 486, 1250.)

Hab. Very abundant throughout the Colony. Var. *γ.* Flinders' Island and Recherche Bay, *Gunn.*—(Fl. Oct.–March.) (*v. v.*)

Distrib. South-eastern Australia, New Zealand. (Cultivated in England.)

An exceedingly variable plant, but yet one of the best marked in the genus, and never passing into any of the following. It is even more abundant in New Zealand than in Australia or Tasmania, and there alpine states of it are quite prostrate.—A rigid shrub, 1–12 feet high, covered with white flowers, and often squarrose, harsh, pun-

gent foliage. Young branches and leaves silky. *Leaves* rigid, spreading, 2 lines to ¾ inch long, extremely variable in shape, from broadly elliptical-ovate or orbicular, to narrow-lanceolate, always glabrous, concave, very acuminate and pungent, one-, three-, or more nerved or nerveless. *Flowers* sessile, very numerous, white, variable in size. *Capsules* half-exserted beyond the calyx.

2. **Leptospermum lanigerum** (Smith in Linn. Trans. iii. 265); erectum, ramulis sericeis, foliis suberectis obovato- v. lineari-lanceolatis abrupte acuminatis utrinque v. subtus calycibusque sericeis villosisve. (*Gunn*, 289, 289? 810.)

Var. *a. pubescens;* foliis utrinque sericeis villosisve.—L. pubescens, *Willd. Sp. Pl.* ii. 949; *Schauer in Linnæa*, xv. 418. L. sericeum, *A. Cunn. MSS.*

Var. *β. lanigera;* foliis supra glaberrimis, calycibus villosissimis.—L. lanigerum, *Ait. Hort. Kew. ed.* 2. iii. 182; *Lodd. Bot. Cab.* ii. 92; *DC. Prodr.* iii. 227. Philadelphus laniger, *Ait. Hort. Kew. ed.* 1. ii. 156. (*Gunn*, 681, 809.)

Var. γ. *grandifolia;* foliis majoribus supra nitidis subtus sericeo-pubescentibus.—L. grandifolium, *Smith, Linn. Trans.* vi. 299; *Bot. Mag. t.* 1810; *Lodd. Bot. Cab. t.* 701; *DC. Prodr.* iii. 227; *Schauer in Linnæa*, xv. 413.

Hab. Abundant throughout the Island, in many soils and situations.—(Fl. all summer.) (*v. v.*) (Colonial name, "Tea-tree.")

Distrib. South-eastern Australia. (Cultivated in England.)

Whole shrub, sometimes green, at others more or less hoary or white, with silky pubescence. A very common and extremely variable lowland and mountain plant, 5–30 feet high, with the trunk attaining 4–5 feet in circumference. I am quite unable to unravel the synonymy of the varieties quoted above, all of which I am convinced are referable to one species.—*Leaves* ¼–1 inch long, linear, plane, oblong-lanceolate or obovate-lanceolate, shortly acuminate or apiculate, the point sometimes recurved, pilose, hoary, silky or villous beneath or on both sides, above nerveless or three- to five-nerved. *Calyx* silky or villous, often densely so, with spreading, soft, white hairs; lobes variable in size and shape, deciduous before the fruit is ripe.—The leaves of this plant have been used by the early colonists as a substitute for Tea.

3. **Leptospermum flavescens** (Smith, Linn. Trans. iii. 162); erectum, ramulis sericeis glabratisve, foliis lineari- v. anguste oblongo-lanceolatis acuminatis pungentibus utrinque glaberrimis nitidis, calycibus sericeis glabratisve.—*Ait. Hort. Kew. ed.* 2. iii. 181; *DC. Prodr.* iii. 227; *Schauer in Linnæa*, xv. 439; *Hook. Bot. Mag. t.* 2695. Melaleuca Thea, *Wendl. Sert. Hann. p.* 24. *t.* 14. L. polygalæfolium, *Sal. Prodr.* iii. L. porophyllum, *Cav. Ic.* iv. 17. *t.* 330. *f.* 2. (*Gunn*, 7, 1962.)

Hab. Abundant on banks of rivers; the only species found near Launceston, *Gunn.*—(Fl. Dec.)

Distrib. South-eastern Australia. (Cultivated in England.)

A shrub or small tree, 5–15 feet high. The longer, glabrous, shining, more acuminate leaves, and glabrous or sparingly silky calyces, alone distinguish this from *L. pubescens*. The Tasmanian specimens differ from the Australian in having larger leaves and whiter flowers.

4. **Leptospermum nitidum** (Hook. fil.); erectum, ramis glaberrimis, ramulis pubescentibus, foliis planis elliptico-oblongis oblongis lanceolatisve pungenti-acuminatis 3-nerviis utrinque glaberrimis nitidis interdum ciliolatis, floribus magnis, calycibus sericeis.—L. pilosum, *Schauer? in Walp. Rep.* ii. 923. (*Gunn*, 813.)

Hab. Rocky Cape; heathy plains between Macquarrie Harbour and Lake St. Clair, *Gunn.*—(Fl. Dec.)

Mr. Gunn considers this a very distinct species, but it appears to me to pass on the one hand into glabrous forms of *L. sericeum*, and on the other into broad-leaved states of *L. flavescens*, so that I cannot by words discri-

minate it satisfactorily from its two predecessors: the leaves are in all my specimens either perfectly glabrous and shining, or sometimes slightly ciliate at the edges; they vary from elliptic-oblong to narrow obovate-lanceolate, and are shortly mucronate, pungent, and three-nerved. The flowers are larger than in *L. flavescens*, the coriaceous bracts more persistent, and the calyces more silky. It appears to be extremely variable in stature; Gunn's early notes describe it as never exceeding 3 feet or so in height, both at Rocky Cape and on the heaths between Lake St. Clair and Macquarrie Harbour; but he afterwards found it in the latter country (at Detention Corner), 12 feet high, and nearer Macquarrie Harbour, 60–80 feet high, with a trunk almost ten feet in girth at three feet from the ground. Such variations are by no means uncommon with ligneous plants in all parts of the world, and prove of how little value habit is in discriminating species. This is possibly Schauer's *L. glaucescens* (see *L. myrtifolium*), but the leaves are not at all glaucous, and the calyx-lobes are not persistent; it is more likely to be his *L. pilosum*, though the leaves of my specimens are uniformly glabrous.

5. **Leptospermum rupestre** (Hook. fil. Ic. Pl. t. 308); humile, procumbens v. prostratum, ramis erectis glaberrimis, ramulis puberulis, foliis parvis obovato-ellipticis spathulatisve obtusis enerviis crasse coriaceis, floribus parvis calycibus subsericeis. (*Gunn*, 295.) (Tab. XXX.)

Hab. Common on the tops of all the mountains, elev. 3–5000 feet, *Frazer, Lawrence, Gunn.*—(Fl. Jan.) (*v. v.*)

A small species (which I suspect will prove to be an alpine state of *L. myrtifolium*), usually growing prostrate and forming dark green masses, but occasionally erect, with more slender branches.—Everywhere glabrous, except the pubescent branchlets. *Leaves* small, crowded, elliptic-obovate or spathulate, blunt, very coriaceous, nerveless, rather concave. *Flowers* smaller than in any other Tasmanian species. *Calyx* silky.—Plate XXX. Fig. 1, leaf; 2, flower; 3, the same, with petals and stamens removed; 4, transverse section of ovary; 5, capsule; 6, vertical section of ditto; 7, unripe, and 8, ripe seeds:—*all magnified.*

6. **Leptospermum myrtifolium** (Sieb. Pl. Exsicc. 314); erectum, glaberrimum v. puberulum, foliis petiolulatis obovato-lanceolatis oblongis subspathulatisve apice rotundatis obtusis v. breviter acuminatis planis coriaceis enerviis 3-nerviisve, floribus mediocribus, calycibus sericeis, capsulis late obconicis calyce inclusis.—*DC. Prodr.* iii. 228. L. parvifolium, *Smith, Linn. Trans.* iii. 263; *DC. l. c.* iii. 228. L. glaucescens, *Schauer? in Linnæa*, xv. 421. L. grandiflorum, *Lodd. Bot. Cab.* 514? Eriostemon? trinerve, *Hook. Bot. Journ.* i. 254. (*Gunn*, 679, 812.)

Hab. Northern parts of the Island, as at Woolnorth and Rocky Cape, on sand-hills near the sea, *Frazer, Lawrence, Gunn.*—(Fl. Nov.–Feb.)

Distrib. South-eastern Australia. (Cultivated in England.)

A shrub, 2–7 feet high, usually quite glabrous, except the buds and calyx, which, as well as the foliage, are sometimes slightly pubescent, and, as Gunn remarks, give a glaucous hue to certain states of it, that caused him to doubt whether there might not be two species. This induces me to quote Schauer's *L. glaucescens*, though he describes the calyx-lobes as persistent.—*Branches* often very slender, terminal ones sometimes like whipcord, and quite glabrous. *Leaves* large or small, obovate, spathulate, oblong-lanceolate or oblong, apex blunt, rounded, or shortly acuminate, not shining as in *L. rupestre*, nerveless or three-nerved. *Flowers* usually small in the Tasmanian state, larger in the Australian; capsule more sunk in the calyx than in the preceding species.—Gunn observes that it flowers later than any of its congeners.

Note. *Leptospermum sericeum* (Lab. Nov. Holl. ii. 9. t. 147) is, according to Schauer (Plant. Preiss. i. 121), a native of South-west Australia, and not of Tasmania.

Gen. VII. FABRICIA, *Gærtn.*

Omnia *Leptospermi*, sed capsula multilocularis et semina pauca.

Very few species of this genus are known, and they differ from *Leptospermum* only in the often many-celled capsule, and fewer, larger seeds. The only Tasmanian species so closely resembles *Leptospermum myrtifolium* as to require no detailed description. (Name in honour of the great Swedish Entomologist, *Fabricius*.)

1. **Fabricia lævigata** (Gærtn. Fruct. i. 175); frutex glaberrimus, foliis obovato- v. cuneato-lanceolatis obtusis apiculatisve.—*Smith in Linn. Trans.* iii. 265; *DC. Prodr.* iii. 229. (*Gunn*, 680.)

Hab. Common in some parts of the north shore of the Island, as at Woolnorth and along the north-west coast (*Gunn*), Islands of Bass' Straits (*Bynoe*), growing in sand near the sea.—(Fl. Oct.)

Distrib. South-eastern Australia.

A handsome shrub, 6–12 feet high, everywhere perfectly glabrous. *Leaves* shortly petioled, very coriaceous and shining, obovate-lanceolate, blunt or apiculate, 1 inch long or less, very variable in breadth. *Flowers* axillary, shortly pedicelled, white; buds pink.

Gen. VIII. BÆCKIA, *L.*

Flores axillares, sessiles v. pedicellati. *Calycis* tubus turbinatus, cum ovario connatus; limbus superus v. ½-superus, persistens, 5-lobus. *Petala* 5, orbiculata. *Stamina* 5–10, sæpe irregulariter inserta; *anthera* dorso glandulifera; *filamenta* libera, brevia. *Ovarium* 2–5-loculare, loculis multiovulatis. *Capsula* loculicide dehiscens. *Semina* plurima, angulata; testa crassa.—Frutices *v.* fruticuli; foliis *parvis, oppositis, exstipulatis;* floribus *solitariis subumbellatisve, albis.*

The species of *Bæckia* are chiefly natives of South-eastern Australia, where nearly 20 species have been discovered, but one is also common in Eastern China and the Malayan Islands, attaining the 30th degree of north latitude. I have not adopted Schauer's genus *Euryomyrtus*, which does not seem to me to be sufficiently different from *Bæckia*. The genus is closely allied to *Leptospermum*, but differs in the much smaller size, usually procumbent habit, small, opposite leaves, generally persistent, imbricate calyx-lobes, and few (five to ten) stamens, that are often unsymmetrically disposed; the seeds are angular, and have a thick testa. (Named in honour of *A. Bæck*, a Swedish Physician.)

1. **Bæckia leptocaulis** (Hook. fil. Ic. Plant. t. 298); erecta, virgata, ramulis gracilibus, foliis oppositis anguste linearibus acutis superne concavis subtus convexis, pedunculis ebracteolatis, pedicellis folio brevioribus, floribus pentandris. (*Gunn*, 817.)

Hab. Abundant on Loddon Plains, on the road to Macquarrie Harbour, and in marshy places at the top of Rocky Cape, growing in both cases with *Leptospermum nitidum, Gunn*.—(Fl. Feb., March.)

A very graceful and pretty species.—*Stem* woody and stout at the very base. *Branches* erect, 1–2 feet high, very slender, straight, and sparingly divided. *Leaves* erect, opposite, about ⅓ inch long, linear, acute, concave above. *Flowers* solitary or two together, small, white. *Pedicel* shorter than the leaves, without bracteoles. *Stamens* five, unsymmetrically placed, four being in two pairs, each pair between two of the petals, and the fifth placed on one side of the base of the intermediate petal.

2. **Bæckia thymifolia** (Hook. fil. Ic. Plant. t. 284 *A.*); prostrata, ramulis diffusis gracilibus, foliis lineari-oblongis linearibusve obtusis marginibus recurvis glaberrimis, pedicellis folia subæquantibus infra medium bibracteolatis, staminibus 10, 5 alternis paulo brevioribus, antheris dorso glandula auctis.—Euryomyrtus thymifolia, *Schauer in Linnæa*, xvii. 239. (*Gunn*, 86.)

Hab. Heathy flats and stony banks of the North and South Esk Rivers, *Lawrence, Gunn*.—(Fl. Oct., Nov.)

A very beautiful plant, from the abundance of its brilliantly white blossoms, forming patches several feet broad. Everywhere glabrous.—*Branches* prostrate, slender. *Leaves* broader than in any of its Tasmanian con-

geners, petioled, about $\frac{1}{3}$ inch long, linear-oblong or linear, blunt at both ends. *Pedicels* longer than the leaves, with two small, connate bracteoles at the middle. *Calyx*-lobes rounded, and petals minutely erose. *Stamens* ten, alternate ones longer.

3. **Bæckia diffusa** (Sieb. Pl. Exsicc. n. 276); prostrata, ramulis diffusis gracilibus, foliis brevissime petiolatis anguste linearibus acutis subacutis mucronatisve asperulis glabrisve, pedicellis foliis brevioribus v. longioribus supra v. ad medium bibracteolatis, staminibus 10.—*DC. Prodr.* iv. 230. B. diffusa, B. prostrata *et* B. affinis, *H.f. Ic. Pl. t.* 284. *f. B, C, D.* Euryomyrtus diffusa, *Schauer in Linnæa,* xvii. 239. (*Gunn,* 683, 816.)

Hab. Abundant on heaths, especially on river-banks, *Gunn, etc.*—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia.

The *B. affinis* and *prostrata,* which I attempted (Ic. Plant. l. c.) to distinguish from one another and from *B. diffusa,* Sieb., have been united by Schauer, and quite rightly, for they are undoubtedly varieties of one plant, in which the leaves vary in breadth, and in being smooth, or rough with minute scattered pubescence; the pedicels are bracteolate at or above the middle, sometimes beneath the flower; the pedicels vary extremely in length and the flowers in size, being twice as large in that I called *B. affinis.* The narrower, smaller, flat, sharp leaves distinguish this from *B. thymifolia;* it is a very common Australian plant, and equally variable there.

4. **Bæckia Gunniana** (Schauer, MSS. in Walp. Rep. Bot. ii. 920); glaberrima, ramis robustis prostratis rarius erectis, ramulis confertis dense foliosis, foliis subimbricatis brevibus lineari-obovatis obtusis obtuse trigonis grosse punctatis, pedicellis folio brevioribus ebracteolatis, staminibus 5–10.—*Schauer in Linnæa,* xvii. 238. B. micrantha, *Hook. fil. Ic. Pl. t.* 309, *non DC.* (*Gunn,* 306, 815.)

Hab. Alpine places, abundant, *Lawrence, Gunn.*—(Fl. Jan.) (*v. v.*)

A pretty, dark green shrub, from a few inches to 5 feet high.—*Stem* very robust, woody. *Branches* numerous, crowded, short, covered with leaves, rigid. *Leaves* imbricate, very small, narrow-obovate, blunt, bluntly three-angled, covered with large glandular dots, 1–2 lines long. *Flowers* small, white. *Pedicels* scarcely longer than the leaves, without bracteoles. *Stamens* variable in number, five to ten; when more than five, some are occasionally imperfect.

Nat. Ord. XXXII. CUCURBITACEÆ.

Of this Order, which is principally a tropical one, and abounds in hot, humid jungles, there are few Australian species, and these, owing to the difficulty of preserving specimens in a good state for examination, are not well determined. I have seen 10 Australian species.

Gen. I. SICYOS, *L.*

Flores 1-sexuales. Fl. ♂ racemosi. *Calyx* campanulatus, 5-dentatus. *Corolla* calyce continua, 5-loba. *Stamina* 3–5; *filamentis* in columnam coalitis; *antheris* liberis, 1-locularibus. Fl. ♀ capitati, umbellati v. solitarii, pedunculati. *Calycis* limbus campanulatus, 5-dentatus. *Ovarium* 1-loculare; *ovulo* solitario; *stylo* 3–5-fido. *Fructus* ovatus, coriaceus, hispidus v. spinosus.

The only Tasmanian species is, I believe, a very widely diffused littoral plant, common upon many shores in the Southern Hemisphere, and in both North and South America. There are no other Australian species.—Prostrate or climbing, alternate-leaved herbs, with subaxillary tendrils, and axillary unisexual flowers, the males racemose, with a five-toothed, bell-shaped calyx, a five-lobed, persistent corolla, and three to five stamens, whose filaments are united into a column; anthers one-celled and free. *Female flowers* capitate, solitary or umbellate on an axillary peduncle, with an inferior, one-celled, one-ovuled ovary, a bell-shaped, five-lobed calyx-limb, and trifid style. *Fruit*

a coriaceous, ovate, hispid or spinous nut, with a pendulous seed. (Name from σικυος, *a cucumber;* from the appearance of the species, which are allied to the Cucumber.)

1. **Sicyos angulatus** (Linn. Sp. Pl. 1438); pubescens v. glabratus, foliis late reniformi-cordatis ovato-cordatisve varie 3–7-lobis, lobis acutis acuminatisve dentatis basi bilobis sinu rotundato, cirrhis 3–5-fidis, fl. ♂ subracemosis, fructibus ovatis.—*DC. Prodr.* iii. 309; *Fl. N. Zeal.* i. 72. S. australis, *Endl. Prodr. Flor. Ins. Norf.* 67. S. Fretensis, *Nob. in Lond. Journ. Bot.* vi. 473. (*Gunn*, 2004.)

Hab. Bass' Straits, on Sisters' Island, east coast of Flinders' Island, *Gunn.*

Distrib. South-eastern Australia, New Zealand, Norfolk Island, and the coasts of North and South America.

A scrambling, herbaceous, glabrous or pubescent plant, with stems 2–4 feet long, most hairy at the nodes.—*Petioles* 1 inch long. *Leaves* about 2 inches broad, cordate at the base, five- to seven-lobed; lobes broad, acute or acuminate, the point of the middle lobe often elongate, all irregularly toothed. *Peduncles* of the male flowers shorter than the petioles. *Ovary* hispid with barbed bristles.

Nat. Ord. XXXIII. PORTULACEÆ.

This Natural Order, which in De Candolle's system is placed in *Calycifloræ*, is in many respects allied to *Caryophylleæ:* from *Ficoideæ* it hardly differs. There are very few Australian genera, and about 30 species, amongst which there are, besides the following, the tropical Asiatic *Trianthema decandra, Glinus lotoides, Sesuvium Portulacastrum,* and *Mollugo Spergula.* Of *Talinum* nearly 20 are known, chiefly natives of South-west Australia.

Gen. I. CALANDRINIA, *H. B. K.*

Calyx persistens, bipartitus. *Petala* 3–10, subhypogyna, libera v. ima basi connata, membranacea, mox gelatinoso-confluentia, ovarium tegentia. *Stamina* 3–15, petalis subopposita et basi iis cohærentia. *Ovarium* liberum, 1-loculare. *Ovula* plurima, columellæ centrali funiculis liberis inserta, amphitropa. *Stylus* filiformis, 3-partitus, lobis intus stigmatosis. *Capsula* 3-valvis. *Semina* plurima, lenticularia. *Albumen* farinaceum. *Embryo* periphericus.—Herbæ *succulentæ;* foliis *alternis, integerrimis, exstipulatis;* floribus *axillaribus v. oppositifoliis.*

The genus *Calandrinia* (which hardly differs from *Claytonia*) is almost exclusively American, the majority of the species being extratropical South American.—*Calyx* persistent, two-parted. *Corolla* usually of five, membranous, hypogynous petals, more or less united at the base, often coalescing after flowering. *Stamens* usually five, opposite the petals, and united to their bases. *Ovary* one-celled, with many ovules, attached by long funiculi to a basal, free placenta. *Stigmas* three. *Capsule* three-valved, with several seeds. *Embryo* surrounding farinaceous albumen. (Named in honour of *J. L. Calandrini,* a Genevese Botanist.)

1. **Calandrinia calyptrata** (Hook. fil. Ic. Pl. t. 296); annua, caule gracili ramoso, foliis parvis lineari-spathulatis superioribus minutis bracteæformibus, pedunculis axillaribus post anthesin deflexis, petalis 5, staminibus 5 petalis subcohærentibus. (*Gunn*, 128.)

Hab. Basaltic rocks, Launceston, *Gunn;* Hobarton, *Dr. Lyall.*—(Fl. Oct.)

Distrib. South-eastern Australia, King George's Sound?

The only other Australian species known to me is the *C. pygmæa* of F. Mueller, from Victoria. There are fine specimens in Herb. Hook. from Baxter, marked as King George's Sound, but as it has not since been found in South-western Australia, and as several of that collector's tickets are erroneous, I am in doubt about the distribu-

tion of the species.—A perfectly glabrous, slender, much-branched, annual weed, 3–6 inches high. *Radical* leaves ½–1 inch long, very narrow, linear-spathulate, rather fleshy; cauline shorter and smaller; upper minute. *Pedicels* slender, in the axils of the upper leaves, ½–¾ inch long, patent, or deflexed after flowering. *Flowers* small, white. *Sepals* ¼ inch long, ovate, acuminate, persistent. *Petals* agglutinated into a calyptra over the ovary, pale pink. *Stamens* 5, apparently free. *Stigmas* three, free, linear-clavate. *Seeds* numerous.

Gen. II. CLAYTONIA, *L.*

Calyx bipartitus. *Petala* 5, hypogyna. *Stamina* 5, petalis opposita et iis basi inserta. *Ovarium* 1-loculare; stylo erecto trifido, ramis intus stigmatiferis; ovulis basin versus loculi funiculis liberis insertis. *Capsula* 3-valvis. *Semina* 3 v. plura, funiculis liberis. *Albumen* farinaceum. *Embryo* periphericus.—Herbæ, foliis *integerrimis, alternis oppositisve;* floribus *solitariis racemosisve.*

This, like *Calandrinia*, is almost wholly an American genus, and one species is a very Arctic one. The only Australian species known to me is the present, which also grows in New Zealand.—Often succulent, herbaceous, annual or perennial plants, with alternate or opposite leaves, and axillary, peduncled flowers or racemes. *Calyx* two-lobed to the base. *Corolla* of five, membranous, generally white petals, often united at the base. *Stamens* five, united each to the claw of a petal. *Ovary* one-celled, with an erect style, trifid at the top, the divisions papillose on the inner surface. *Ovules* numerous, situated near the base of the cavity, amphitropous. *Seeds* three or more, attached to long, free funiculi, with farinaceous albumen, and a curved, cylindrical embryo. (Named in honour of *John Clayton*, an English botanist and traveller in North America.)

1. **Claytonia Australasica** (Hook. fil. Ic. Pl. t. 293); cæspitosa, caulibus prostratis radicantibus, foliis anguste et longe linearibus, petiolis basi membranaceis dilatatis, pedunculis axillaribus elongatis 1-floris.—*Fl. N. Zeal.* i. 73. (*Gunn*, 160.)

Hab. Common in moist places throughout the Island, ascending to 4000 feet.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. New South Wales, South-eastern Australia, New Zealand.

Extremely variable in size and habit, according to the moisture, etc., of the locality it inhabits.—A small, tufted plant, 1 inch high in drier places; a very long, straggling herb, a foot long, in water. *Stems* prostrate, rooting. *Leaves* ½–5 inches long, very long, linear, strap-shaped; petioles with a dilated, membranous vagina at the base. *Flowers* on axillary, slender peduncles. *Sepals* orbicular, concave, one-quarter as long as the petals, but variable in proportionate size. *Petals* obovate-oblong or spathulate, very membranous, white, extremely variable in size.—Dr. Mueller sends a curious succulent variety, from an elevation of 5000 feet on Mount Buller, Victoria.

Gen. III. MONTIA, *L.*

Omnia *Claytoniæ*, sed sepalis interdum 3 et seminibus 1–3.

1. **Montia fontana** (L. Sp. Pl. 129).—*Engl. Bot. t.* 1206; *DC. Prodr.* iii. 362; *Fl. Ant.* i. 13, ii. 278; *Fl. N. Zeal.* i. 74. M. lamprosperma, *Chamisso in Linnæa*, vi. 565. *t.* 7. (*Gunn*, 2007.)

Hab. St. Patrick's River, in springs, elev. 1500 feet, abundantly, *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. New Zealand, Lord Auckland's and Campbell's Islands, Fuegia, the Falkland Islands, and Kerguelen's Land; temperate Europe, Asia, and North America, to the Arctic Circle.

A small, tufted, water or marsh plant, found in many quarters of the globe, and only distinguished from *Claytonia* by the sepals being sometimes three, and the seeds fewer than three.—*Stems* often attaining 6–8 inches in water. *Leaves* spathulate or narrow linear-spathulate, succulent, ¼–1 inch long. *Flowers* white, small, in solitary, axillary, rather thick, curved or straight peduncles.—The apparent rarity of this plant in Tasmania is remarkable, for it is usually of very frequent occurrence in the countries it inhabits. (Named in honour of *Joseph de Monti*, a Bolognese botanist.)

Nat. Ord. XXXIV. CRASSULACEÆ.

The number (8 or 10) of Australian *Crassulaceæ* is much smaller than might have been expected, considering how analogous the climate and soil of many parts of that continent are to those of South Africa, where they abound. The absence of any succulent vegetation (*Aloe, Euphorbia, Stapelia, Cactus, Mesembryanthemum,* and *Crassula*) in the desert of Australia is a very remarkable feature, and in this respect it contrasts with other dry climates. What *Crassulaceæ* there are, almost all belong to the widely diffused genus *Tillæa,* which is also European.

Gen. I. TILLÆA, *Mich.*

Sepala, petala, et *stamina* 3–5. *Squamæ* ad basin carpellorum 3–5 v. 0. *Ovaria* 3–5; *stylis* brevibus, recurvis; *ovulis* plurimis. *Carpella* 3–5, membranacea, intus dehiscentia. *Semina* pauca v. numerosa. —Herbæ *pusillæ;* foliis *oppositis, basi connatis, integerrimis;* floribus *parvis, axillaribus.*

There are probably five or six species of this genus in Australia, but they have not been closely examined: some are very similar to South African and South American ones. I have considered the species of *Bulliarda* as members of the genus, differing only in the presence of stipitate glands, of very variable size, at the bases of the ovaries.—Small, generally minute, succulent, opposite-leaved plants, with axillary, solitary or fascicled, inconspicuous flowers. *Sepals, petals, stamens,* and *carpels* three to five, the latter with short, recurved styles, and few or many seeds. (Named in honour of *Michael Angelo Tilli,* a botanist of Pisa.)

1. **Tillæa verticillaris** (DC. Prodr. iii. 382); caule erecto simplici v. e basi ramosissimo, foliis lineari-oblongis basi connatis, floribus 4-meris dense congestis plerisque sessilibus sed paucis in quovis fasciculo pedicellatis, sepalis petalisque subulato-acuminatis, squamis hypogynis 0, carpellis 1–2-spermis.—*Fl. N. Zeal.* i. 75 (*non Hook. Ic. Pl. t.* 295). (*Gunn,* 91.)

Hab. Common on dry rocks and gravel in many parts of the Colony.—(Fl. Oct.–Feb.) (*v. v.*)

Distrib. Extratropical Australia, New Zealand, South Africa.

An erect, succulent herb, 2–6 inches high, generally growing in small tufts. *Leaves* linear-oblong, blunt, 1–2 lines long. *Flowers* densely crowded, very minute, most of them sessile, a few pedicelled ones project beyond the rest. *Sepals* four, ovate, subulate, acuminate. *Hypogynous scales* 0. *Carpels* one- or few-seeded.—This approaches very closely to the European *T. muscosa*, but is larger, has larger and tetramerous flowers, and narrower sepals.

2. **Tillæa purpurata** (Nob. in Lond. Journ. Bot. vi. 472); perpusilla, caulibus e basi decumbente ramosa erectis prostratisve, foliis oppositis basi connatis linearibus, floribus pedicellatis 4-meris, sepalis ovatis obtusis v. subacutis, petalis parvis acuminatis, squamis hypogynis 0, carpellis 4 magnis obtusis apice hiante bilobo, seminibus numerosis.—*Fl. N. Zeal.* i. 74. (*Gunn,* 1967.)

Hab. Wet places, Formosa, *Gunn.*—(Fl. Nov.)

Distrib. South-eastern and South-western Australia; New Zealand.

A very minute, slender-stemmed, decumbent, red-purple plant, hardly 1 inch high, but with the branches elongating as they fruit.—*Leaves* minute, linear. *Flowers* on solitary, slender pedicels, which are generally much elongated, but sometimes short. *Flowers* larger in proportion to the size of the plant than in *T. verticillaris*. *Sepals* and *petals* four, nearly equal in size. *Hypogynous scales* 0. *Carpels* very large, bilobed at the apex, when ripe many-seeded.

3. **Tillæa macrantha** (Nob. in Hook. Ic. Pl. t. 310); pusilla, caulibus brevibus dichotome ramosis erectis, foliis ovatis brevibus, floribus gracile pedicellatis pro planta magnis tetrameris, sepalis oblongis acutis ciliolatis, petalis ovatis subacutis carpellisque lineari-oblongis sepalis æquilongis. (*Gunn,* 1117.)

Hab. Very abundant at Georgetown, in wet hollows, *Gunn.*—(Fl. Oct.–Feb.)
Distrib. South-eastern and south-western Australia.

A very distinct little species, 1–2 inches high. *Stems* erect, dichotomously branched. *Leaves* oblong, blunt. *Flowers* pedicelled, some of the pedicels very long and slender. *Flowers* large for the size of the plant. *Sepals* four, oblong, acute, minutely ciliate. *Petals* four, rather smaller than the sepals. *Scales* 0. *Carpels* linear-oblong, rostrate, many-seeded, about as long as the sepals.

4. **Tillæa (Bulliarda) recurva** (Hook. fil.); cæspitosa, caulibus elongatis parce ramosis, foliis anguste lanceolatis linearibusve acuminatis, floribus tetrameris axillaribus solitariis pedicellatis nutantibus, pedicellis foliis brevioribus, sepalis ovato-oblongis acuminatis petalis lanceolatis æquilongis, squamis hypogynis lineari-spathulatis ovariis recurvis rostratis dimidio brevioribus.—Tillæa verticillaris, *Hook. Ic. Pl. t.* ccxcv. *excl. descript.* (*Gunn*, 393.)

Hab. Common in bogs and inundated places throughout the Colony, as at Circular Head, the Derwent, Launceston, etc., *Gunn.*—(Fl. Oct.–Feb.) (*v. v.*)

Distrib. South-eastern Australia.

A very distinct species, belonging to the section *Bulliarda*, with scales at the base of the carpels. *Stems* sometimes floating, 6–10 inches long, in shallow water or marshes quite prostrate and short. *Leaves* $\frac{1}{2}$–$1\frac{1}{2}$ inch long, linear-lanceolate or linear-acuminate, the nerves in the broader-leaved specimens recurved. *Flowers* inclined or nodding, on slender, axillary, solitary pedicels, shorter than the leaves. *Sepals* four, with acuminate, recurved tips. *Petals* lanceolate, shorter than the sepals. *Carpels* produced into recurved beaks, twice as long as the spathulate hypogynous scales.

Note. The *Tillæa moschata*, Hook. fil., a very common New Zealand and Antarctic plant, has not yet been met with in Tasmania, but may be expected to occur on the south coast; it generally grows on maritime rocks, and has oblong leaves, rather large white or pink flowers, and cuneate, hypogynous scales.

Nat. Ord. XXXV. FICOIDEÆ, *Juss.*

The rarity of succulent plants in Australia has been alluded to under the Order *Crassulaceæ*. One of the Tasmanian *Mesembryanthema* is confined to that Colony and Australia, and the other is found in New Zealand also. Of *Tetragonia*, the other genus, of which numerous South African species are known, there are in Australia only the two Tasmanian species.

Gen. I. MESEMBRYANTHEMUM, *L.*

Sepala 4–5, plus minusve inter se et cum ovario connata. *Petala* numerosa, linearia, 1- v. pluriseriata. *Stamina* numerosa. *Ovarium* 1-pluriloculare; *stigmatibus* plurimis distinctis; *ovulis* perplurimis, funiculis capillaribus liberis confluentibusve insertis. *Capsula* uni-multilocularis, multivalvis. *Semina* plurima.—Herbæ *crassæ*; foliis *oppositis, carnosis*; floribus *conspicuis, sessilibus pedunculatisve.*

This very extensive South African genus may be recognized by its fleshy habit, its *sepals* being more or less united together, and with the ovaries; by the numerous linear petals often in several rows, and stamens; and by the carpels being all confined into a few- or many-celled, many-seeded fruit, dehiscing along the top of each cell, and bearing free stigmata.—*Ovules* on long cords, numerous. (Name from μεσημβρια, *midday*, and ανθος, *flower*; from many species opening their flowers only at midday.)

1. **Mesembryanthemum æquilaterale** (Ait. Hort. Kew. ii. 187); caule repente teretiusculo,

foliis lineari-oblongis triquetris glaucis incurvatis lævibus, pedunculis obtuse ancipitibus bibracteatis, stigmatibus 5 subulatis.—*DC. Prodr.* iii. 428. M. demissum, *Willd. En. Suppl. p.* 36. (*Gunn*, 818.)

Hab. Abundant on the sea-coasts, and ascending the rivers as far as their waters are salt.—(Fl. Dec.) (Colonial name, "Pigs'-faces.") (*v. v.*)

Distrib. South-eastern and South-western? Australia.

A common sea-shore plant, the fruit of which is edible and agreeable, about the size of a good gooseberry: it may be readily recognized by the fleshy, linear, triangular, opposite leaves, 1–3 inches long and ¼ inch broad. *Flowers* solitary, terminal, on thick peduncles, 1½ inch across. *Sepals* rounded. *Petals* very numerous, slender, linear.

2. **Mesembryanthemum australe** (Sol. in Ait. Hort. Kew. ii. 187); foliis linearibus lineari-oblongisve obtusis triquetris lævibus glaucis punctatis, pedunculo compresso folio æquilongo sursum clavato.—*DC. Prodr.* iii. 428; *Fl. N. Zeal.* i. 76. *An* M. clavellatum, *Harv. Misc. Nat.* 79? (*Gunn*, 819.)

Hab. Woolnorth, Circular Head, and mouth of the Tamar, *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. Southern coast of Australia, New Zealand.

I have seen the flowers only of this species sent by Gunn, with notes, from which it appears that there is so little reason to doubt its being identical with the *M. australe* that I have described it as above, from Australian and New Zealand specimens. It is a smaller and more slender plant than *M. æquilaterale*, with narrower, smaller, less angled, linear or oblong leaves, longer, clavate peduncles, and smaller flowers.

Gen. II. TETRAGONIA, *L.*

Flores polygamo-dioici?. *Calycis* tubus ovario 4-gono continuus; lobis 4, obtusis. *Petala* 0. *Stamina* 4–12. *Styli* 3–8, breves. *Fructus* subdrupaceus, 4-gonus v. prismaticus, angulis obtusis v. in cornua productis; endocarpio osseo, 3–8-loculari, loculis 1-spermis.—Herbæ *crassæ*; foliis *alternis*.

This genus is almost confined to the southern hemisphere, one species alone having hitherto been found in the North Pacific; the majority are natives of South Africa. Procumbent or climbing, littoral, herbaceous or somewhat shrubby plants, with alternate, petiolate, fleshy leaves, and axillary, peduncled flowers.—*Calyx*-tube adnate with the ovary, four-angled; limb six-lobed. *Petals* 0. *Stamens* four to twelve. *Styles* three to eight, short. *Fruit* an obconic, four-angled drupe, with a fleshy, green sarcocarp, and a bony endocarp, often produced into four or more lateral horns, three- to eight-celled, with a pendulous seed in each cell. (Name from τετρα, *four*, and γωνια, *an angle*; from the four-angled calyx.)

1. **Tetragonia expansa** (Sol. in Ait. Hort. Kew. ii. 178); prostrata, foliis amplis petiolatis ovatis triangulari-ovatis v. basi concavo-subhastatis integerrimis obtusis acutisve, floribus breviter pedunculatis, staminibus 16 in fasciculis 4 petalis alternis dispositis, stigmatibus 6–8, fructibus obconicis obtuse 4-gonis 4-cornutis v. 8-cornutis cornubus alternis minoribus.—*DC. Prodr.* iii. 452; *Plant. Grass. t.* 114; *Bot. Mag. t.* 2362. T. cornuta, *Gærtn. Fruct. p.* 11. *t.* 179. *f.* 3. T. halimifolia, *Forst. Prodr.* 223. T. Japonica, *Thunb. Jap. p.* 208. Demidofia tetragonioides, *Pall. Hort. Demid. t.* 1. (*Gunn*, 1258.)

Hab. Northern shores of the Island, as at Georgetown, *Gunn.*

Distrib. Southern and eastern Australia, New Zealand, extratropical South America, Japan. (Cultivated in England.)

Gunn's specimens precisely accord with the figure of De Candolle ('Plantes Grasses'), who quotes the Japan plant as being the same; they are further identical with South American specimens, but the New Zealand ones are considerably smaller, with rather longer peduncles and smaller flowers and fruit, precisely according with Bonin Island specimens of *T. expansa*. Like so many seaside, herbaceous plants, this varies greatly in size, and I am

strongly inclined to suspect that *T. implexicoma* is the male plant of it.—*Stems* decumbent, several feet long, branched, brittle, covered with yellow bark. *Leaves* petiolate, $1\frac{1}{2}$–$2\frac{1}{2}$ inches long, ovate, ovate-triangular, or rhomboid, acute or obtuse, quite entire, sometimes concave at the base, when they are almost hastate, pale green. *Flowers* solitary, axillary, on short peduncles, $\frac{1}{4}$ inch long. *Drupes* nearly $\frac{1}{2}$ inch long, with four horns, and sometimes four other smaller ones alternating with them.—This plant is used as a spinach in New Zealand, and is very palatable; it sometimes bears flowers at the tops of the horns of the fruit.

2. **Tetragonia implexicoma** (Hook. fil.); caulibus decumbentibus v. elongatis erectis et scandentibus, foliis lineari-oblongis ellipticis rhombeisve punctis elevatis crystallinis opertis junioribus pilosis, pedunculis gracilibus, floribus parvis, calycis lobis inæqualibus lineari-oblongis subacutis, staminibus 12 disco annulari insertis, stylis 2 elongatis, ovario 2-loculari.—Tetragonella implexicoma, *Miq. in Plant. Preiss.* i. 245. (*Gunn*, 737.)

Hab. Abundant on all the coasts, sometimes festooning the bushes by the shore.—(Fl. Oct.) (*v. v.*) "Ice plant."

Distrib. South coast of Australia.

Having never found any of my numerous specimens of this plant, from Tasmania or Australia, to bear fruit, I am inclined to suspect that it is the male plant of *T. expansa*. It varies extremely in the size of its leaves, those of large-leaved specimens equalling the *T. expansa*, from which however it usually differs in the smaller size of all its parts, narrower, lanceolate or oblong-rhomboid leaves, and long, slender pedicels. In its live state the surface of the leaves and young stems is covered with bullate watery cells, giving a crystalline look to the whole, whence its name of "Ice Plant."

Nat. Ord. XXXVI. CUNONIACEÆ.

This Order, or Suborder of *Saxifrageæ*, as it is considered by many, differs from the latter in its shrubby or arboreous habit, persistent foliage, usually opposite leaves, and interpetiolar stipules. *Tetracarpæa*, however, a doubtful member of the Order, has exstipulate, alternate leaves, and *Bauera*, an anomalous member, has no stipules. The greater number of the species are natives of the Southern Hemisphere, where they may be regarded as representing the *Saxifrages* of the north temperate zone, which are almost entirely absent. There are seven or eight Australian species of the Order, belonging to almost as many genera; they are almost exclusively confined to the east coast and Tasmania.

Gen. I. ANODOPETALUM, *A. Cunn.*

Calycis lobi 4, valvati. *Petala* 4, parva, lanceolata, disco perigyno inserta. *Stamina* 8, cum petalis inserta; *filamentis* filiformibus; *antheris* cordatis, connectivo in processum producto. *Ovarium* liberum, 2-loculare; *ovulis* paucis, pendulis; *stylis* 2, gracilibus, divergentibus, liberis. *Capsula* bilocularis, bivalvis.—Frutex *v.* arbor *glaberrimus*; foliis *simplicibus, coriaceis, lanceolatis, obtuse serratis, obtusis*; stipulis *lanceolatis*; floribus *axillaribus, parvis, solitariis paucisve, breve pedunculatis*; pedunculis *bibracteolatis*; sepalis *intus pubescentibus, lanceolatis.*

1. **Anodopetalum biglandulosum** (A. Cunn. MSS).—Weinmannia biglandulosa, *A. Cunn. in Hook. Ic. Plant. t.* 301. (*Gunn*, 287.)

Hab. Subalpine districts, often forming a dense and almost impenetrable scrub, Franklin River, Lake St. Clair, Hampshire Hills, etc., *A. Cunningham, Gunn.*—(Fl. Feb.)

This curious plant usually forms a straggling bush 8–10 feet high, but also attains a height of 60–70 feet, with a trunk of 4 feet in girth. Everywhere quite glabrous.—*Stems* and *branches* very tough, covered with shining

bark. *Leaves* $1\frac{1}{2}$–$2\frac{1}{2}$ inches long, lanceolate, obtuse, shortly petioled, obtusely serrate, deep green, coriaceous, shining; stipules lanceolate. *Flowers* axillary, small, solitary or few together, shortly peduncled, $\frac{1}{4}$ inch diameter. ***Sepals*** **four, spreading, connate at the base, lanceolate, valvate, pubescent within.** ***Petals*** **much smaller than the** sepals, inserted into a lobed disc. *Stamens* inserted into the disc; filaments slender, as long as the sepals; anthers cordate, produced into a long point. ***Ovary*** **free, two-celled, with two diverging, slender styles.** ***Ovules*** **few, pen-**dulous from the dissepiments of the ovary. (Name from **ανοδος**, ***difficult of access***, and **πεταλον**, in allusion to the small petals.)

Gen. II. BAUERA, *Kenned.*

Calyx tubo brevissimo, limbo 6–10-partito. *Petala* 6–10, perigyna. *Stamina* indefinita v. definita, antheris dorso affixis, loculis connatis. *Ovarium* basi calycis adnatum, 2-loculare, ovulis in placentis medio dissepimento utrinque adnatis horizontalibus; *stylis* 2, filiformibus, divaricatis. *Capsula* 2-locularis, biloba, loculis rima loculicide dehiscentibus. *Semina* pauca; testa granulosa v. minute reticulata; raphe elevata. *Embryo* in axi albuminis carnosi orthotropus, rectus, cylindraceus; cotyledonibus brevibus.—Frutices, foliis *oppositis, sessilibus,* 3-*foliolatis, exstipulatis;* floribus *axillaribus, solitariis, pedicellatis.*

This pretty and very curious genus is confined to South-eastern Australia and Tasmania; several species have been described, but they are probably all reducible to one. It has no immediate allies, and has by some been considered the type of a distinct Natural Family.—Small, straggling or subscandent shrubs, with opposite, exstipulate, trifoliolate leaves, and axillary, one-flowered, solitary peduncles. *Flowers* white or pink. *Calyx* with six to ten spreading lobes. *Petals* six to ten, perigynous. *Stamens* numerous, perigynous, with slender filaments attached to the back of the anthers, whose cells are united throughout their length, and blunt. *Ovary* adnate with the base of the calyx, two-celled, with many ovules and two spreading, slender styles. *Capsule* two-lobed, with two cells and many seeds, bursting along the top of each cell. (Named in honour of the brothers *Francis* and *Ferdinand Bauer*, the celebrated Botanical painters.)

1. **Bauera rubioides** (Andr. Bot. Rep. t. 198); ramulis pubescenti-pilosis, foliolis glaberrimis v. superne pilosis lanceolatis subcrenatis, pedunculis foliis brevioribus longioribusve, petalis lineari-oblongis obovato-oblongisve, staminibus numerosis.—*Sims, Bot. Mag. t.* 715; *Vent. Jard. Malm. t.* 96; *DC. Prodr.* iv. 13. B. rubiæfolia, *Salisb. Ann. Bot.* i. 514. *t.* 10. B. sessiliflora, *F. Muell. Trans. Vict. Instit.*

Variat insigniter statura, magnitudine florum et foliorum, ramis erectis v. prostratis v. subscandentibus, foliolis ellipticis lanceolatisve brevibus elongatisve, pagina superiore glaberrima v. pilosa, petalis obovatis linearibusve albis v. roseis.

Var. *α*; 6–8-pedalis, caulibus diffusis subscandentibus, ramulis robustis, foliolis glaberrimis $\frac{1}{3}$–$\frac{3}{4}$-uncialibus. (*Gunn,* 156.)

Var. *β. humilis;* 3–5-pedalis, caule erecto ramulis divaricatis gracilioribus, foliolis glaberrimis v. superne pilosis.—B. humilis, *Sweet, Hort. Sub.* 124; *DC. Prodr.* iv. 13; *Lodd. Bot. Cab.* 1197. (*Gunn,* 626.)

Var. *γ. depressa;* **caule brevi, ramis depressis, ramulis robustis gracilibusve.**

Var. δ. *microphylla;* caule depresso ramisque interdum valde elongatis prostratis divaricatim ramosis, foliolis minimis oblongis.—B. microphylla, *Sieb. Pl. Exsicc.* 286; *DC. Prodr.* iv. 13. (*Gunn,* 820.)

(Tab. XXXI.)

Hab. Very abundant throughout the Colony, generally growing in poor, wet soil.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. **South-eastern Australia.** (Cultivated in England.)

A very common and beautiful plant, singularly variable, easily recognized by its much-branched, slender, hairy stems, small, sessile, trifoliolate leaves, with elliptical or lanceolate leaflets that are obscurely crenate, glabrous or hairy,

and its pretty rose or white flowers on short or long pedicels. Gunn has in vain attempted to distinguish two species amongst its many forms, and recognizes three different states, one a large one, 5–6 feet high, straggling amongst and over other shrubs; it is very common everywhere: secondly, a smaller form, covering acres, erect and 3–4 feet high, with spreading branches; and thirdly, a dwarf variety, erect, but with the branches depressed or prostrate, forming great patches on the ground.—Plate XXXI. Fig. 1, portion of branch and leaves; 2, flower; 3, calyx and ovary, etc.; 4, petal; 5, stamen; 6, seed; 7, vertical section of the same; 8, embryo:—*all magnified.*

? Gen. III. TETRACARPÆA, *Hook. fil.*

Calyx profunde 4-lobus, lobis patentibus, imbricatis. *Petala* 4, unguiculata, imbricata. *Stamina* 8, hypogyna; *filamentis* gracilibus; *antheris* basifixis, lineari-oblongis, loculis adnatis lateraliter dehiscentibus. *Ovaria* 4, stipitata, erecta; *stylis* brevibus, stigmatibus simplicibus; *ovulis* perplurimis, anatropis, placentis marginalibus adnexis. *Semina* perplurima, minima; *testa* laxa; nucleo minimo, albumine carnoso et oleoso; *embryone* hilo proximo, minimo, late obovoideo v. globoso.—Fruticulus *glaberrimus, erectus;* foliis *alternis, exstipulatis, persistentibus, coriaceis;* floribus *in racemos erectos terminales dispositis, albis.*

1. **Tetracarpæa Tasmanica** (Nob. in Hook. Ic. Plant. t. 264). (*Gunn*, 293.)

Hab. Subalpine situations, common: Hampshire Hills, sources of Meander River, Mount Wellington, etc., *Milligan, Gunn.*—(Fl. Jan.) (*v. v.*)

This curious and anomalous little plant has been referred by Endlicher to *Dilleniaceæ*, with which Order it has certainly many characters in common, perhaps more than with *Cunoniaceæ*, but from which it differs remarkably in habit, in the coriaceous, evergreen, shining foliage, terminal, racemose inflorescence, quaternary floral whorls, persistent sepals, loose, membranous testa, oily, fleshy albumen, and minute, globular embryo; it is however allied to both the *Dilleniaceæ* and *Magnoliaceæ* in the hypogynous stamens and petals, adnate anthers with lateral dehiscence, and free, stipitate carpels, which latter are however more like those of *Crassulaceæ* than of any other Order. In the alternate, exstipulate leaves, it differs from *Cunoniaceæ*, and agrees with *Anopterus* and *Escallonieæ*, but differs from these again in the free carpels; the structure and consistence of the albumen and embryo is altogether that of *Anopterus*.—A small, woody shrub, 6 inches to 1 foot high, with erect, simple, or sparingly branched, sulcate stem. *Leaves* alternate, shortly petioled, obovate-oblong or obovate-lanceolate, tapering at the base, blunt or retuse, unequally serrate, very coriaceous, deep green and shining, about 1 inch long. *Flowers* in erect, terminal racemes, which are 1–2 inches high, white, $\frac{1}{3}$ inch long. *Pedicels* slender, with a minute toothed bract at the base. *Sepals* four, small, united at the base, ovate, spreading. *Petals* four, erect, obovate, clawed, imbricate. *Stamens* eight, alternate and opposite the petals and of equal length with them, hypogynous; filaments very slender; anthers linear-oblong, adnate to the filament at the base, blunt, with lateral dehiscence. *Ovaries* four, linear-oblong, stipitate, each narrowed into a short style bearing a simple stigma. *Ovules* very numerous on the ventral suture, anatropous. *Follicles* small, erect, dehiscing in the ventral faces. *Seeds* very numerous, minute, horizontal, oblong, blunt at both ends. *Testa* loose, membranous, almost winged. *Albumen* very fleshy and oily. *Embryo* minute, almost globose, at the base of the albumen; *radicle* next the hilum. (Name from τετρα, *four*, and καρπος, *a fruit.*)

Nat. Ord. XXXVII. ESCALLONIEÆ.

This small Order, established by Brown in the 'Appendix to Flinders' Voyage,' has, as well as *Cunoniaceæ*, been usually considered as a section of *Saxifrageæ*, and I think rightly; but having kept it up in the New Zealand Flora, I have thought it better to do so in this Work also. It differs from *Saxifrageæ* in the shrubby or arboreous habit, coriaceous foliage, and united styles, and from *Cunoniaceæ* in the alternate, exstipulate leaves and united styles. The characters of the foliage are however broken through by placing *Tetracarpæa* in *Cunoniaceæ*, and the absence of stipules in *Bauera* is a further sign of the invalidity of these Orders.

Gen. I. ANOPTERUS, *Lab.*

Calycis tubus turbinatus, limbi 6-partiti lobis acutis persistentibus. *Petala* 6, perigyna. *Stamina* 6, cum petalis inserta, iisdem alterna; *filamentis* crassiusculis, subulatis; *antheris* cordatis. *Ovarium* basi calycis adhærens, conico-cylindraceum, 1-loculare; ovulis ad suturas parietales biseriatis, pendulis; *stylo* brevissimo, simplici, stigmate bifido. *Capsula* oblonga, unilocularis, 2-valvis, valvis margine seminiferis. *Semina* imbricata, compressa, superne alata. *Embryo* intra albumen carnosum minimus, subglobosus; radicula supera.—Frutex *v.* arbor *glaberrimus;* foliis *alternis, lanceolatis, acutis, obtuse serratis, in petiolum angustatis, coriaceis, lucidis;* racemis *terminalibus, basi squamosis;* bracteolis *caducis.*

1. **Anopterus glandulosus** (Lab. Nov. Holl. i. 86. t. 112).—*DC. Prodr.* iv. 6; *Hook. Bot. Mag.* 4317. (*Gunn*, 524.)

Hab. Abundant in many, and especially subalpine, parts of the Colony, growing in forests: Port Arthur, Recherche Bay, Hampshire Hills, etc.—(Fl. Sept.–Nov.) (*v. v.*) (Cultivated in England.)

One of the most beautiful Tasmanian plants, both from the richness of its dark green, glossy foliage, and abundance of drooping racemes of white flowers. It usually forms a shrub 6–10 feet high, extremely like *Cenarrhenes nitida* in general appearance (Gunn); but in the Acheron Valley, on the road to Macquarrie Harbour, Gunn collected specimens from trees 30–40 feet high.—*Leaves* chiefly at the ends of the branches, spreading, 3–8 inches long, lanceolate, acute, tapering to a short petiole, coarsely, bluntly serrate, very coriaceous. *Racemes* terminal, sometimes panicled at the base, nodding, 3–6 inches long, many-flowered, surrounded with short, imbricate bracts at the base. *Bractlets* at the base of the pedicels, deciduous; pedicels ½ inch long. *Flowers* white, ¾ inch across. *Calyx* obconical at the base, with six short, acute, spreading segments. *Petals* six, obovate-oblong. *Stamens* six, alternate with the petals; *filaments* subulate, shorter than the petals; *anthers* cordate. *Ovary* conical, two-celled, with many parietal ovules, tapering into a short style and bifid stigma. *Capsules* on spreading, elongated, rigid pedicels, surrounded at the base with the calyx-tube, one-celled, two-valved; valves recurved. *Seeds* very numerous, imbricated, winged. (Name from *ανω, upwards,* and *πτερον, a wing;* in allusion to the ascending wing of the seed.)

Nat. Ord. XXXVIII. UMBELLIFERÆ.

The Australian *Umbelliferæ* are not numerous, but very peculiar, chiefly belonging to sections of the Order which are sparingly found in the northern zone. About 120 species are known, and half of these are confined to the eastern parts of the Continent, but few are common to both sides, and about 50 are exclusively South-west Australian.

Gen. I. HYDROCOTYLE, *Tourn.*

Fructus a latere plano-compressus, biscutatus, calycis limbo truncato v. obsolete 5-lobo coronatus; *mericarpiis* evittatis, jugis filiformibus, dorsalibus et marginalibus, sæpe obsoletis, intermediis duobus interdum accretis. *Petala* ovata, integra, apice recto.—Herbæ *repentes, tenellæ;* umbellis *pedunculatis, axillaribus, simplicibus;* involucro *oligophyllo.*

The Australian *Hydrocotyles* are all slender, creeping marsh-plants, with solitary or tufted petioled leaves at the nodes, and solitary, erect peduncles, bearing simple umbels of very minute white or greenish flowers.—*Calyx*-limb obsolete, or five-lobed. *Petals* five, generally acute, without an inflexed point. *Stamens* five. *Carpels* didymous, much laterally compressed, generally with one or more semicircular ridges down each face, often enclosing a small hollow.—About twenty Australian species are known, most of them being peculiar to that continent. (Name from *ὑδωρ, water,* and *κοτυλη, a cup;* in allusion to the form of the leaf of the European species.)

a. *Leaves not lobed. Mericarps with two to three ribs on each side.*

1. **Hydrocotyle Asiatica** (Linn. Sp. Pl. 234); pubescens v. glabrata, foliis ovato-oblongis v. rotundato-cordatis sinuatis crenatis integerrimisve, pedunculis folio brevioribus, involucri foliolis 2 ovatis, umbellis 2–3-floris, mericarpiis utrinque 2–3-costatis planis reticulatisve.—*DC. Prodr.* iv. 62; *Fl. N. Zeal.* i. 83. H. cordifolia, *Nob. in Hook. Ic. Pl. t.* 303. (*Gunn*, 876.)

Hab. Marshes, Arthur's Lakes, Circular Head, and Launceston, *Gunn.*—(Fl. Jan.) (*v. v.*)

Distrib. Throughout Australia, New Zealand, and the Tropics generally.

A very distinct species, easily recognized by its robust habit, leaves fascicled at the rooting nodes of the creeping stem, petioles often very long, blade of the leaf cordate-crenate or entire, blunt.—*Peduncles* short. *Involucral* leaflets few, large. *Flowers* two to three. *Mericarps* large, with broad ribs.

b. *Leaves lobed (not partite to the base). Umbels many-flowered. Mericarps with one ridge.*

2. **Hydrocotyle hirta** (Br. in Rich. Hydr. n. 40); pubescenti-pilosa, caulibus vage repentibus, foliis utrinque hirtis gracile petiolatis reniformibus 7–9-lobis, lobis brevibus obtusis dentatis crenatisve, pedunculis petiolis brevioribus, floribus numerosis capitatis sessilibus, mericarpiis parvis utrinque 1-costatis.—*DC. Prodr.* iv. 66. H. densiflora, *DC. Prodr.* iv. 67. (*Gunn*, 553.)

Hab. Abundant in wet places throughout the Colony.—(Fl. summer.) (*v. v.*)

Distrib. South-eastern Australia and New South Wales.

A slender, creeping species, always more or less hairy or very pubescent.—*Leaves* solitary, reniform, seven- to nine-lobed, lobes toothed or crenate. *Umbels* many-flowered, capitate. *Flowers* sessile. *Mericarps* small.

c. *Leaves lobed (not partite to the base). Umbels few (three- to six-flowered). Mericarps with one ridge.*

3. **Hydrocotyle pedunclaris** (Br. in Rich. Hydr. p. 38. f. 26); cæspitosa, glaberrima v. pubescens, caulibus rigidiusculis, foliis minutis breve petiolatis reniformi-rotundatis 3–5-lobis, lobis grosse dentatis glabris v. subtus petiolisque hirtis, pedunculis petiolis æquilongis, umbellis sub-3–6-floris, floribus brevissime pedicellatis, mericarpiis utrinque 1-costatis.—*DC. Prodr.* iv. 66; *Nob. in Lond. Journ. Bot.* vi. 467. (Tab. XXXII. *B.*)

Var. *α*; foliis inciso-dentatis supra glabris.—Planta Brownii.

Var. *β*; foliis obtuse lobatis, lobis 3-crenatis glabriusculis, petiolis hirsutis. (*Gunn*, 878.)

Var. *γ*; caule gracili, foliis obtuse lobatis utrinque hirtis, pedunculis petiolisque hirsutis. (*Gunn*, 1119.)

Var. *δ*; caule elongato, foliis profunde lobatis, lobis obtuse 3-fidis crenatisve utrinque petiolis pedunculisque glabratis v. parce pilosis.—N. gracilenta, *Nob. in Lond. Journ. Bot.* vi. 467. (*Gunn*, 878? 554?)

Hab. Marshes, Circular Head, summit of the Western Mountains and Hampshire Hills, *Gunn.*—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia.

A very variable plant, often extremely minute.—*Stems* tufted and matted, stout. *Leaves* very variable in size, from 1 line to ½ inch diameter, rounded and reniform, three- to five-lobed, generally glabrous above and pilose below; lobes coarsely toothed. *Peduncles* about as long as the petioles. *Umbels* generally three-flowered. *Fruit* shortly pedicelled.—Compared to the size of the leaves, the stems of this plant are often remarkably robust, and often covered with the withered remains of the old stipules and bases of the petioles.—Plate XXXII. *B.* Fig. 1, leaf; 2, flower; 3, the same with the petals and stamens removed; 4, fruit; 5, transverse section of ditto:—*all magnified.*

4. **Hydrocotyle Tasmanica** (Nob. in Lond. Journ. Bot. vi. 467); caule graciliusculo glabro v. hirto, petiolis pedunculisque æquilongis hirtis, foliis reniformibus reniformi-rotundatisve obtuse 5–7-lobis

utrinque hirtis v. superne glabris, lobis 3–5-crenatis dentatis, stipulis ovatis obtusis integerrimis, umbellis sub-6-floris, mericarpiis utrinque 1-costatis. (*Gunn*, 553, 1118.) (Tab. XXXII. *A.*)

Hab. Marshes in various parts of the Colony, as at Circular Head and Arthur's Lakes, *Gunn.*—(Fl. Jan.)

Distrib. South-eastern Australia.

A small species, very similar to *H. hirta*, Br., but with narrower stipules, fewer flowers in the umbel, and with the leaves seldom hairy on both surfaces.—Plate XXXII. *A.* Fig. 1, leaf; 2, flower; 3, ditto, with petals removed; 4, petal; 5, fruit; 6, transverse section of ditto:—*all magnified.*

5. **Hydrocotyle vagans** (Hook. fil. in Lond. Journ. Bot. vi. 468); glaberrima v. sparse pilosa, caule gracili elongato, foliis gracile petiolatis reniformi-rotundatis 5–7-lobis membranaceis lobis obtuse crenatis, pedunculis petiolo multoties brevioribus, umbellis parvis sub-6-floris, mericarpiis utrinque 1-costatis. (*Gunn*, 174, 554.) (Tab. XXXIII. *A.*)

Hab. Abundant in flooded places, South Esk River, *Gunn.*

Distrib. South-eastern Australia.

A larger species than any of the preceding of this section, generally quite glabrous, but with sometimes a few hairs on the stem, petioles, peduncles, and leaves.—*Stems* long and slender, in drier places rigid. *Leaves* with long, slender petioles, rounded-reniform, obtusely lobed; lobes obtusely crenate. *Peduncles* much shorter than the petioles. *Umbels* about six-flowered. *Fruit* like that of the three preceding species.—Plate XXXIII. *A.* Fig. 1, flower; 2, immature fruit; 3, transverse section of ditto:—*all magnified.*

6. **Hydrocotyle pterocarpa** (Muell. in Trans. Vict. Instit. 1854–5, p. 46); glaberrima v. parce pilosa, caulibus gracilibus elongatis, foliis longissime petiolatis peltatim reniformi-rotundatis obtuse crenato-lobatis membranaceis, pedunculis petiolo brevioribus, umbellis 3–5-floris, mericarpiis compressissimis late alatis utrinque bilobis. (Tab. XXXIII. *B. et C.*)

Hab. Formosa, *Gunn.*

Distrib. South-eastern Australia, *Mueller.*

I have but very indifferent Tasmanian specimens, that were interlaced with some other aquatic plants sent by Gunn; these however exactly accord with better ones sent from Victoria by Mueller. This is a larger species than any of the preceding, with long, creeping stems, slender petioles 2–6 inches long, large, membranous, rounded-reniform, almost peltate leaves, more or less obscurely lobed or crenate, with broad, truncate lobes, and short peduncles.—*Fruit* pedicelled, much larger than in any other Tasmanian species, deeply notched or lobed at the base and apex. *Mericarps* very much compressed, with one conspicuous ridge on each face, and a broad, dorsal wing.—Plate XXXIII. *B*, Tasmanian, and *C*, Victoria specimens of *H. pterocarpa*:—Fig. 1, flower: 2. fruit, 3, transverse section of ditto—all from Victoria specimens, and *highly magnified.*

d. *Leaves divided to the base into three to five segments.*

7. **Hydrocotyle tripartita** (Br. in Rich. Hydr. p. 46. f. 25); glaberrima v. pilosula, caulibus e radice descendente plurimis undique patentibus rigidis gracilibus parce divaricatim ramosis et foliosis non aut raro radicantibus, foliis breve petiolatis palmatisectis, segmentis 3–5 angusto-cuneatis trifidis, pedunculus floriferis brevibus fructiferis petiolo brevioribus longioribusve, fructibus 8–20 pedicellatis, mericarpiis utrinque 1-costatis inter costam et commissuram foveola impressa notatis.—*DC. Prodr.* iv. 65; *Hook. Ic. Pl. t.* 312. (*Gunn*, 547.)

Hab. Penquite, near Launceston, *Gunn.*—(Fl. Oct.)

Distrib. South-eastern Australia; Melbourne, *Adamson.*

A very remarkable and distinct little species, quite unlike any other known to me in habit and characters.—

Root annual, sending out many rigid, slender, spreading stems 2–4 inches long, that are sparingly branched, and do not root at the joints. *Leaves* on short petioles, palmately cut to the base into three to five narrow cuneate, trifid lobes. *Peduncles* short in flower, elongating in fruit. *Flowers* pedicelled. *Fruits* very small. *Mericarps* rather thicker than usual in the genus, with one prominent, semicircular ridge on each face, between which rib and the commissure is a well-defined pit.

8. **Hydrocotyle muscosa** (Br. in Rich. Hydr. p. 45. f. 27); pusilla, caulibus cæspitosis repentibus, foliis gracile petiolatis palmatisectis, segmentis 3–5 cuneatis trifidis, pedunculis petiolo brevioribus, umbellis 3–6-floris, fructibus sessilibus, mericarpiis utrinque 1-costatis, costis nerviformibus.—*DC. Prodr.* iv. 64. (*Gunn*, 885.)

Hab. Circular Head, forming large patches in moist places, *Gunn*.—(Fl. Jan.)

Distrib. Australia.

I have seen no Australian specimens of this plant, for the identification of which I depend on the insufficient drawing and description of Richard. The foliage is exactly that of *H. tripartita*, but the whole plant much smaller, of a very different habit, having interlacing, creeping, rooting stems and branches, and the fruit is very different.

Gen. II. DIDISCUS, *DC.*

Fructus a latere plano-compressissimus, biscutatus, calycis limbo obsoleto coronatus; mericarpiis evittatis, jugis filiformibus, dorsalibus et marginalibus sæpe obsoletis, intermedio elevato curvilineo. *Petala* obovata, integra, obtusa, apice recto. *Styli* elongati, divergentes.—Herbæ *simpliciusculæ, erectæ;* foliis *lobatis multipartitisve;* umbellis *simplicibus compositisve, involucratis involucellatisque;* floribus *albis cæruleisque.*

An Australian genus, of about twenty species, chiefly extratropical, found both in the south-eastern and south-western quarters of the continent, no species however being common to both. The structure of the flower and fruit is almost the same as that of *Hydrocotyle*, but the habit is entirely different, more resembling the common northern forms of *Umbelliferæ* than the Australian species usually do.—Erect, annual herbs, simple or branched, with simple or compound umbels. *Mericarps* very much laterally compressed, almost flat, didymous, much contracted vertically towards the commissure, each with a strong, thickened, curved ridge near the commissure on either face, looking like an adherent lobe. *Calyx*-limb obsolete. *Petals* obovate, concave. *Styles* slender, diverging. (Name from δις, *two*, and δισκος, *a disc;* in allusion to the form of the mericarps.)

1. **Didiscus pilosus** (Benth. in Pl. Hügel. p. 54, in not.); pilosa v. glabrata, caule erecto robusto ramoso, foliis radicalibus longe petiolatis palmatisectis, segmentis cuneatis incisis inciso-lobatisve dentatis, caulinis lobis angustioribus, umbellis compositis, involucri foliolis linearibus integerrimis inciso-lobatisve, involucelli foliolis subsetaceis, floribus parvis, fructibus hirsutis.—*Hook. Ic. Pl. t.* 307. (*Gunn*, 825.)

Hab. On the coasts between Circular Head and Woolnorth, in sandy soil, *Gunn*.—(Fl. Jan.)

Distrib. South-eastern Australia: Victoria and New South Wales. ("Native Parsnip" of Victoria.)

A common South Australian coast-plant, but also found by Cunningham and Frazer in the interior of New South Wales.—*Stems* hollow, erect, 1–3 feet high, branched, grooved, pilose below, as are the petioles and leaves more or less. *Radical leaves* palmatisect, segments cuneiform, cut and toothed; cauline cut into narrower segments. *Umbels* compound, branches often very numerous. *Partial umbels* of very many rays. *Involucre* of many simple or lobed leaflets; partial of narrow subulate or lanceolate leaflets, often united at the base. *Flowers* small, white (or bluish?).

2. **Didiscus humilis** (Nob. in Hook. Ic. Pl. t. 304); scapigera, acaulis, foliis omnibus radicalibus gracile petiolatis ovatis irregulariter 3–5-lobis (primordialibus integris), lobis obtusis glaberrimis v. parce

pilosis, scapis erectis fructiferis declinatis, umbella simplici parva multiflora, involucri foliolis linearibus, fructibus hirsutis. (*Gunn*, 245.)

Hab. Abundant in subalpine situations, as at Marlborough, the Hampshire Hills, Middlesex Plains, etc., *Lawrence, Gunn, Backhouse.*—(Fl. Dec., Jan.)

Distrib. Alps of South-eastern Australia, elev. 5000 feet, *Mueller.*

A much smaller species than *D. pilosus*, and of a different habit, probably perennial.—*Leaves* all radical, very numerous, 3–8 inches long, ovate, three- or five-lobed; lobes unequal, blunt; glabrous or sparingly hairy; petioles slender. *Scapes* several, longer than the leaves, erect in flower, bent suddenly at the base when in fruit, so that the main part lies parallel to the ground, the umbel being still erect. *Umbel* simple, many-flowered.

Gen. III. XANTHOSIA, *Rudge.*

Fructus a latere compressus, lobis 5 calycis coronatus; mericarpiis ad commissuram contractis, 7–9-jugis, jugis 2 lateralibus marginantibus. *Petala* unguiculata, cuspidata v. carinata. *Styli* filiformes.—Suffrutices *v.* herbæ, *sæpius stellatim pilosæ;* foliis *lobatis dissectisve;* umbellis *axillaribus terminalibusve, sæpe pauciforis, incompletis;* involucri foliolis *sæpe inæqualibus.*

An Australian genus, the species of which differ greatly in habit. About twelve are known; they are chiefly extratropical; some are shrubby and leafy, others small, subherbaceous plants.—*Umbels* few-flowered, axillary, with few unequal involucral leaves. *Calyx-lobes* distinct. *Mericarps* laterally compressed, with seven to nine ridges, much contracted at the commissure. (Name from ξανθος, *yellow;* in allusion to the tawny hairs on some of the species.)

1. **Xanthosia montana** (Sieb. Fl. Nov. Holl. Exs. p. 248); suffruticosa, tota tomentosa v. villosa, caulibus lignosis ramosis foliosis, foliis ovatis varie 3-sectis v. 3-lobatis, lobis obtusis crenatis superne pubescenti-pilosis inferne ferrugineo-tomentosis, umbellis axillaribus inconspicuis breve v. longe pedunculatis 1–3-floris, involucri foliis 1–3 oblongis linearibusve tomentosis albis v. ferrugineis.—*DC. Prodr.* iv. 74. X. pilosa, *Rudge, Linn. Trans.* x. 361. *t.* 22. *f.* 1. X. hirsuta, *DC. l. c.* (*Gunn*, 218.)

Hab. Common in many places on the north coast, in poor sandy or peaty soil, which is wet in winter; as at Rocky Cape, Black River, Georgetown, etc., also in Flinders' Island, *Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia: Victoria and New South Wales.

Bentham (Plant. Hügel.) has pointed out the identity of *X. pilosa* and *hirsuta*, but remarks that *X. montana* always differs in having one-flowered peduncles; I find however that the flowers vary from one to three in the Tasmanian specimens. It abounds on the south-eastern parts of the continent of Australia, from Port Jackson to Bass' Straits.—A small shrub, 1–2 feet high, branching, erect or prostrate, everywhere pilose or tomentose. *Stems* and branches woody and leafy. *Leaves* ½–1 inch long, on rather slender, short petioles, which, as well as the young branches and under surface of the leaves, are when dry densely clothed with red-brown tomentum; lamina trifid, three-lobed or tripartite; segments blunt, entire or cut. *Umbels* small and inconspicuous, sessile or on short or long tomentose peduncles, one- to three-flowered. *Involucral* leaves few, linear or oblong, when narrow covered with tomentum; when broader, white and membranous at the margin, tomentose along the back. *Flowers* nearly sessile.

2. **Xanthosia dissecta** (Nob. in Hook. Ic. Pl. t. 302); pusilla, glaberrima, caulibus e radice perplurimis gracilibus diffusis, foliis longe petiolatis palmatim 3-sectis v. biternatim sectis, segmentis linearibus acutis, umbellis parvis axillaribus breve pedunculatis 3–5-floris, involucri foliolis inæqualibus ovato-lanceolatis subulatisve, floribus subsessilibus.—Hydrocotyle apiifolia, *A. Cunn. MSS. in Herb. Hook.* (*Gunn*, 880.)

Hab. Northern shores of the Colony, at Rocky Cape and Georgetown, *Gunn.*—(Fl. Oct.–Dec.)

Distrib. South-eastern Australia: Victoria and New South Wales.

The Tasmanian specimens appear to be a small state of a very much more robust plant which Mueller has sent from Victoria (as *X. dissecta*), and which has broader, white, membranous involucral scales.—*Roots* perennial. *Stems* 3–5 inches long, very numerous, slender, filiform, prostrate, sparingly branched. *Leaves* glabrous, both the cauline and radical on slender petioles, tripartite, or twice or thrice cut into narrow, cuneate, sessile, or petiolulate, entire or cut, acute lobes. *Umbels* very small, at the axils of the leaves or ends of the branches, three- to five-flowered. *Involucral scales* very small, subulate or lanceolate, with membranous margins; flowers nearly sessile; mericarps nine-ribbed. *Calyx*-lobes ovate, deciduous.

3. **Xanthosia pusilla** (Bunge in Plant. Preiss. i. 290); parvula, pilosa, caulibus e radice plurimis brevibus diffusis foliosis, foliis breve petiolatis trisectis, segmentis ellipticis lanceolatisve integris v. varie bi-trilobis subacutis, umbellis axillaribus 1–2-floris breviter pedunculatis, floribus subsessilibus, involucri foliolis 2–3 lanceolatis floribus æquilongis.

Var. β; mericarpiis brevioribus latioribusque. (*Gunn*, 879, 1122.)

Hab. Var. β. Northern shores of the Colony, in sandy soil (sometimes growing mixed with *X. dissecta*): Circular Head and Georgetown, *Gunn*.—(Fl. Oct.–Dec.)

Distrib. South-western and South-eastern Australia.

This is so very similar to the *X. pusilla*, Bunge, of Swan River and King George's Sound, that I can only distinguish it by the broader mericarps; it is also very near *X. glabrata*, Bunge, of the same country, but is more villous.—A small, annual?, tufted plant, more or less covered with long hairs. *Stems* many from the root, 2–3 inches long, prostrate, not nearly so slender as in *X. dissecta*, leafy. *Leaves* shortly petioled, cut into three elliptical-oblong or lanceolate, entire or toothed or cut, coriaceous segments, whose margins are flat or revolute, and under surface pale.

Gen. IV. DIPLASPIS, *Hook. fil.*

Flores monoici v. dioici. *Fructus* a dorso compressissimus, calycis margine valde contracto truncato coronatus; mericarpiis parallele biscutatis, late ovatis, acutis, evittatis, stylopodiis parvis stylisque brevibus erectis terminatis; costis 5 nerviformibus, 1 dorsali, 2 angulos laterales acutissimos mericarpii marginantibus, 2 ad commissuram angustissimam valde contractam sitis. *Petala* ovata, obtusa, apice non inflexa.—Herbæ *acaules, scapigeræ, carnosulæ;* foliis *omnibus radicalibus, petiolatis, reniformi-rotundatis;* umbellis *simplicibus;* involucri *foliolis linearibus;* fructu Bolacis.

A curious genus, confined to the alps of South-eastern Australia and Tasmania; only two species are known, they are nearly allied to the Andean and Fuegian genus *Huanaca*.—Herbs, with fibrous roots, radical, petiolate, broad cordate, reniform leaves, and solitary scapes, bearing simple umbels of many flowers, surrounded by linear involucral leaves. Fruit of two extremely compressed, ovate, acute mericarps, placed face to face, their backs quite flat or concave, with one central ridge, the thin edges each with a pair of slender ridges, and another pair placed near one another on the face of each mericarp, close to the much-contracted commissure. *Calyx*-margin much contracted, truncate. *Petals* ovate or obovate, entire. *Stylopodia* small, elongated. *Styles* rigid, erect. (Name from διπλοος, *double*, and ασπις, *a shield*.)

1. **Diplaspis Hydrocotyle** (Hook. fil. in Lond. Journ. Bot. vi. 469); glaberrima v. parce pilosa, foliis cordato-rotundatis, mericarpiis late ovatis. (*Gunn*, 1120, 1253.) (Tab. XXXIV.)

Hab. Marshes and wet sandy ground on the banks of alpine lakes, Lake St. Clair, Arthur's Lakes, and summit of the Western Mountains, *Gunn*.—(Fl. Jan.)

Distrib. South-eastern Australia (Mount Hotham, elev. 6000 feet, *Mueller*).

Very variable in size. *Leaves* spreading or recurved, quite glabrous, rounded, cordate. *Scape* 1–4 inches tall,

stout, erect, slightly hairy below the umbels. *Involucral* leaves subulate-lanceolate. *Fruit* pedicelled, pedicels 2 lines long; *mericarps* broadly ovate, about $\frac{2}{3}$ line long.—PLATE XXXIV. Fig. 1, flower; 2, lateral view of ovarium; 3, transverse section of unripe mericarps; 4, ripe fruit; 5, lateral view of ditto; 6, transverse section of ripe mericarp; 7, vertical section of seed:—*all magnified.*

2. **Diplaspis cordifolia** (Hook. fil.); petiolis scapisque patentim hirsutis, foliis rotundatis basi cordatis subcrenatis marginibus recurvis, umbellis multifloris, mericarpiis oblongis.—Pozoopsis cordifolia, *Hook. Ic. Pl. t.* 859. (*Gunn*, 2043.)

HAB. Marshy places on Mount Sorrell, Macquarrie Harbour, *Gunn.*—(Fl. Dec.)

Very similar to the last, but larger, with spreading hairs on the scapes and petioles, rounder, more coriaceous leaves, with strongly recurved margins, many more flowers in the umbels, longer pedicels, and longer, oblong mericarps.

Gen. V. DICHOPETALUM, *Muell.*

Fructus a dorso compressus, calycis limbi lobis 5 petaloideis deciduis coronatus; mericarpiis parallele biscutatis, evittatis, 5-jugis, jugis 1 dorsali, 2 angulos obtusos mericarpii marginantibus, 2 commissuræ valde contractæ approximatis. *Petala* 5, lobos calycis æquantia, oblonga, concava, apice non inflexa. *Stamina* 4–5; *stylopodia* crassa, stylis 2, subelongatis.—Herba *strigoso-hirta, habitu* Fragosiæ; radice *crassissima;* foliis *coriaceis, omnibus radicalibus, plurimis, patentibus, longe petiolatis, reniformibus, palmatim* 5–7-*lobatis, lobis* 3–5-*dentatis;* scapis *elongatis, pauciforis:* umbellis *irregularibus;* involucri foliolis 2–4-*lobatis, herbaceis, hirtis;* radiis 2–3 *inæquilongis, longioribus umbellulam* 3–4-*radiatam gerentibus:* involucelli *foliolis lanceolatis;* floribus *pedicellatis, pedicellis longe setosis et sparse stellatim pilosis.*

1. **Dichopetalum ranunculaceum** (Mueller in Trans. Vict. Instit. 1854-5, p. 25; Hook. Journ. Bot. vii. 378. 1855, t. xi.).

Var. *Tasmanica;* major, foliis superne setosis, floribus minoribus. (TAB. XXXV.)

HAB. Var. *β.* Mount Sorrell, Macquarrie Harbour, *Milligan, Gunn.*—(Fl. Jan.)

DISTRIB. South-eastern Australia. (Summit of Munyang Mountains, elev. 5–7000 feet, *Mueller.*)

An exceedingly curious plant, easily recognized by the five large calyx-lobes equalling the petals, and exactly like them. Whole plant hispid with stiff long setæ.—*Root* as thick as the thumb, fleshy. *Leaves* very numerous, 3–5 inches long, on long erect or spreading petioles; blade about 1 inch across, broader than long, reniform, but hardly notched at the base, palmately five- to seven-lobed, lobes three-toothed, nerves radiating from the petiole. *Scapes* long, slender, inclined or prostrate, bearing few flowers, dispersed in an irregular, sparingly-branched umbel. *Involucral leaves* few, linear, herbaceous, lobed or cut; of the partial involucres smaller, narrower, more membranous. *Pedicels* setose. *Calyx-tube* with a few stellate hairs, that fall away from the ripe fruit. *Mericarps* of the same form and character as those of *Diplaspis*, but not so compressed. *Calyx-lobes* and *petals* very deciduous. *Stamens* four or five. *Stylopodia* large. *Styles* diverging. (Name from διχα. *double*, and πεταλον, *a petal;* in allusion to the large petaloid calyx-lobes.)—PLATE XXXV. Fig. 1, flower; 2, stellate pedicelled hairs; 3, petal; 4, flower, with petals removed: 5, immature fruit; 6, the same cut transversely:—*all magnified.*

Gen. VI. HEMIPHUES, *Hook. fil.*

Fructus ovatus, obliquus, turgidus, 1-locularis! mericarpiis conferruminatis v. unico omnino evanido, calycis limbi lobis 5 inæqualibus deciduis coronatus, evittatus, 5-costatus, costis calycis lobis oppositis inconspicuis. *Petala* 5, linearia, interdum nulla? *Stamina* 5. *Stylopodia* connata, in stylos 2 breves erectos fissa.—Herbæ *alpicolæ, dense cæspitosæ, scapigeræ, plus minusve pilosæ v. lanatæ;* foliis *omnibus radicalibus, petiolatis, spathulatis, integerrimis dentatisve;* scapis *brevibus, robustis;* umbella *simplici;* involucri *foliolis in cupulam multidentatam coalitis;* floribus *sessilibus, inconspicuis.*

1. **Hemiphues bellidioides** (Hook. fil. in Lond. Journ. Bot. vi. 470).

Var. *suffocata;* densissime compacta, foliis integerrimis.—H. suffocata, *Nob. l. c.* (*Gunn,* 1970.) (Tab. XXXVI. *A.*)

Var. *tridentata;* foliis apice trilobis tridentatisve.—H. tridentata, *Nob. l. c.* (*Gunn,* 1969.) (Tab. XXXVI. *B.*)

Var. *fulva;* foliis grosse crenatis, calycis lobis ciliatis.—H. bellidioides, *Nob. l. c.* (Tab. XXXVI. *C.*)

Var. *affinis;* foliis subcrenatis, calycis lobis glaberrimis.—H. affinis, *Nob. l. c.* (Tab. XXXVI. *D.*)

Hab. On Mount Fatigue, south-south-west of Lake St. Clair, elev. 4000 feet; also at Recherche Bay, *Gunn.*—(Fl. Oct. Nov.)

This is one of the most curious plants of the Order to which it belongs, and quite unlike any other; one of the mericarps appears as if wholly suppressed, but is in reality entirely incorporated with the other, and its cavity obliterated; the stylopodia and styles are however nearly equal, and, except the obliquity of the whole fruit, there are no outward signs of the fruit being other than simple. I much regret never having seen flowering specimens, all Mr. Gunn's being far advanced in fruit. The ridges of the fruit are not very well defined, or constant in figure or position, and, as with all alpine plants, there are many variations in the amount of pubescence and wool, form and crenatures of the leaves, etc. Though so anomalous, I have little doubt that the true place of the genus is amongst the tribe *Saniculeæ* of *Umbelliferæ*, but it cannot be ranked close to any known genus. The analogy between its fruit and that of *Gunnera* (with its two styles but solitary cell and ovule) is very close.—A small, perennial-rooted, herbaceous plant, forming large, flat, dense tufts in wet or boggy soil; whole plant more or less shaggy with white or fulvous hairs. *Leaves* all radical, numerous, spreading, $\frac{1}{4}$–$\frac{3}{4}$ inch long, with sheathing petioles, spathulate, obovate-oblong or oblong, blunt, coriaceous, quite entire or three-toothed or obtusely crenate leaves. *Scapes* solitary, 1–2 inches high, erect, stout, villous with spreading hairs, leafless, or bearing one small, short bract. *Umbel* solitary, terminal, simple, $\frac{1}{4}$ inch broad, surrounded by a cup-shaped involucre of six to ten leaves, united at the base or to the middle, their free apices lanceolate, blunt. *Flowers* six to ten, sessile. *Fruit* obliquely obovate, sessile, compressed, coriaceous, sometimes hairy at the base, with five obscure ribs, and as many oblong, blunt, unequal, glabrous, or hairy calyx-teeth, which fall away when the fruit is quite ripe. *Petals* small, erect, linear. *Filaments* long, subulate; *anthers* broad. *Stylopodia* thick, elongated, united throughout their length, split into two erect, somewhat connivent, subulate stigmata. *Seed* solitary, pendulous, with a dark-coloured, mottled, very membranous testa.—I at one time divided this species into four, but, upon re-examination of many specimens, am inclined to suppose all to be varieties of one. The flowers may be unisexual in some states, with sometimes only four ridges, and as many calyx-lobes. (Name from ἡμι, *half*, and φυω, *to be empty;* in allusion to the suppressed mericarp.)—Plate XXXVI. *A*, var. *suffocata*, fig. 1, leaf; 2, umbels; 3 and 4, fruits; 5, transverse section of ditto; 6, seed:—*all magnified*. *B*, var. *tridentata*, fig. 1, leaf; 2, umbel; 3, fruit:—*all magnified*. *C*, var. *fulva*, fig. 1, leaf; 2, immature fruit, with stamens and petals adhering; 3, petal; 4, stamen; 5, mature fruit:—*all magnified*. *D*, var. *affinis*, fig. 1, leaf; 2, immature fruit, with stamens adhering; 3, mature ditto; 4, transverse section of ditto:—*all magnified*.

Gen. VII. MICROSCIADIUM, *Hook. fil.*

Fructus **elongato-ovatus v. subcylindricus,** calycis limbi lobis ovatis acutis coronatus; mericarpiis **semiteretibus, dorso convexis, evittatis,** 5–7-jugis v. angulatis, ad commissuram vix contractis. *Petala* 5, ovata, obtusa, apice non inflexa. *Stamina* 5, filamentis brevibus. *Stylopodia* crassa. *Styli* validi, subulati, recurvi.—Herbæ *acaules, glaberrimæ;* foliis *omnibus radicalibus, coriaceis, lobatis v. dentatis;* scapis *erectis, rigidis, apice dichotome ramosis;* ramis 1-*floris v.* umbellam *simplicem pauciforam gerentibus, ad basin ramorum v. umbellæ bracteatis;* floribus *parvis.*

Of this curious genus (of the tribe *Saniculeæ*) only two species are at present known, one the Tasmanian, and

another much larger, discovered by the indefatigable Dr. Mueller on the alps of South-eastern Australia, and described by him as *Pozoa* § *Sphagnosciadium cuneifolium* in the 'Transactions of the Victoria Institute,' and as *Microsciadium cuneifolium* in the seventh volume of the 'Kew Journal of Botany.' Both are glabrous herbs, with perennial roots, simple, petiolate, radical leaves, and slender, wiry scapes, that are in the *M. cuneifolium*, Muell., dichotomously branched, with single-flowered branches, but which in the Tasmanian species bear irregular umbels of two to three flowers, on very long pedicels.—*Calyx*-tube obconic, limb five-toothed. *Petals* ovate, blunt. *Stamens* short. *Stylopodia* very large. *Styles* short, recurved. *Fruit* ovate; *mericarps* convex or semiterete, without vittæ, five- to seven-angled or five- to seven-ribbed, crowned with the persistent calyx-lobes, scarcely contracted at the commissure. (Name from *μικρος, small,* and *σκιαδιος, an umbelliferous plant.*)

1. **Microsciadium Saxifraga** (Hook. fil. in Lond. Journ. Bot. vi. 468); foliis petiolatis coriaceis orbiculatis late ovato-cordatisve grosse dentatis v. multi-lobatis, lobis subacutis, scapis gracilibus, umbellis 2–3-floris, involucri foliolis oblongis parvis. (*Gunn,* 1968.)

Hab. Abundant in wet, heathy places in the Loddon Plains, on the road to Macquarrie Harbour, *Gunn;* Macquarrie Harbour, *Milligan.*—(Fl. Feb.)

A small, inconspicuous plant, 3–5 inches high.—*Leaves* few, coriaceous, petiolate, orbicular or broadly ovate-cordate, cut at the edge into large teeth or deep lobes. *Scapes* bearing a two- to three-flowered umbel of small flowers on long pedicels.

Gen. VIII. ERYNGIUM, *L.*

Fructus subteres, ovatus, squamatus, calycis lobis 5 foliaceis coronatus; mericarpiis semiteretibus, evittatis, ejugatis, carpophoro per totam longitudinem adnatis. *Petala* abrupte emarginata cum apice inflexo. *Stamina* 5. *Stylopodia* subglobosa. *Styli* filiformes.—Herbæ *acaules v. caulescentes, rigida, sæpius pungentes;* umbellis *in capitula densa ovoidea aggregatis;* involucri *foliolis exterioribus radiatis, interioribus sparsis, paleaceis, floribus immixtis.*

There are two Australian species of this genus, which abounds in South Europe and South America, but is scarce in other parts of the globe. One of the Australian ones is also Tasmanian, and the other (*E. ovinum*, A. Cunn., a tall branched species) is common to New South Wales, Victoria, and South-western Australia.—*Herbs* with often coriaceous, pungent leaves. *Umbels* deformed and aggregated into capitula, surrounded at the base by a whorl of involucral leaves, the leaves of the partial involucres scattered amongst the flowers. *Fruit* ovoid, crowned with the five large calyx-lobes, without vittæ or ribs. *Petals* truncate, with a deep notch and inflected point. *Stamens* five. *Stylopodia* globose. (Name, the *ερυγγιον* of Dioscorides.)

1. **Eryngium vesiculosum** (Lab. Pl. Nov. Holl. i. 73. t. 98); glaberrimum, foliis radicalibus longe petiolatis lanceolato-oblongis linearibusve acuminatis grosse argute inæqualiter spinoso-dentatis subpinnatifidisve, surculis prostratis nodosis hic illic foliosis (foliis imperfectis), pedunculis radicalibus erectis, involucri 8–10-phylli foliolis radiatis lanceolato-subulatis pungentibus capitulo depresso multo longioribus, calyce squamulis bullatis dense obtecto.—*DC. Prodr.* iv. 92; *Fl. N. Zeal.* i. 85. (*Gunn,* 379, 492, 821.)

Hab. Marshy places in the northern and central parts of the Island, *Gunn, Milligan.*—(Fl. Feb.)

Distrib. South-eastern and South-western Australia; New Zealand.

A very variable plant, from 1 to 8 or 10 inches high.—*Roots* stout, descending, as thick as a goose-quill, throwing out stolones 4–8 inches long, that do not root. *Radical* leaves tufted, 3–6 inches long, on long petioles, rarely $\frac{1}{2}$ inch broad, deeply toothed or pinnatifid, the segments sharp, spinous. *Stolones* jointed or knotted, with a pair of small toothed leaves at the joint. *Umbels* peduncled or sessile, radical; peduncles longer or shorter than the leaves. *Involucral* leaves $\frac{1}{4}$–$\frac{1}{3}$ inch long, spreading, rigid, pungent. *Flowers* in small dense heads, very incon-

spicuous. *Calyx* densely covered with imbricating, bullate, membranous, chaffy scales; its lobes ovate, acuminate. *Petals* very deeply notched, the inflexed apex lying flat on the face of the petal, laciniate at the tip.

Gen. IX. CRANTZIA, *Nutt.*

Fructus subrotundus, fere orbicularis, calycis limbo obscure 5-dentato coronatus; mericarpiis (sæpe inæqualibus) semiteretibus, ad commissuram non contractis, 5-sulcatis, jugis 7 crassis semiteretibus, valleculis 1-vittatis. *Petala* 5, apice non inflexa. *Semen* versus commissuram carinatum.—Herba *pusilla, repens;* foliis *filiformibus, cylindraceis, articulatis;* umbella *simplici;* involucro *parvo, oligophyllo.*

1. **Crantzia lineata** (Nutt. Gen. Plant. Am. i. 177).—*DC. Prodr.* iv. 70; *Fl. Ant.* i. 287. *t.* 100; *Fl. N. Zeal.* i. 86. C. Australasica, *Muell. MSS.* (*Gunn,* 2008.)

Hab. Marshes near Launceston, Arthur's Lakes, etc., *Gunn.*—(Fl. Dec., Jan.) (*v. v.*)

Distrib. South-eastern Australia, New Zealand, Falkland Islands, and east coast of extratropical South America, United States, lat. 30° N. to 42° N.

Rhizome as thick as a crow-quill, 2–6 inches long, creeping and rooting at the joints. *Leaves* all radical, filiform, ½–4 inches long, slender, transparent and hollow-jointed, pale green, ¼–2 lines broad, in American specimens sometimes expanding into a flat lamina. *Peduncles* slender, erect or decumbent, shorter than the leaves. *Umbels* simple, few-flowered. *Involucral* leaves few, much shorter than the pedicels. *Flowers* four to ten in an umbel, minute, long-pedicelled. *Calyx*-limb obscurely five-toothed. *Petals* ovate, without an inflexed apex. *Fruit* rounded, contracted at the apex; *mericarps* semiterete, spongy, not contracted at the commissure, five-furrowed, the ribs thick and convex.—I have stated in the 'Flora of New Zealand' that I consider this plant as allied to *Œnanthe* and *Ottoa*, and not to *Hydrocotyle*, near which it is doubtfully placed by De Candolle. (Name in honour of *Professor Crantz*, author of a work upon umbelliferous plants.)

Gen. X. APIUM, *Hoffm.*

Fructus subrotundus v. didymus, lateraliter compressus, calycis limbo truncato terminatus; mericarpiis 5-jugis, jugis filiformibus crassisve; valleculis 1–3-vittatis; carpophoro indiviso. *Semen* antice planiusculum. *Petala* subrotunda, integra.—Herbæ *odoræ;* foliis *decompositis;* umbellis *subsessilibus, simplicibus v. compositis, exinvolucratis exinvolucellatisque.*

I have discussed the subject of the probable specific identity of the southern and northern wild Celery in the 'Flora of New Zealand' and 'Flora Antarctica,' and pointed out that the thicker and more spongy ribs of the fruit of the southern species is the only tangible character by which it can be distinguished, and I fear that it is not a very constant one. In all other respects of size, form, and cutting of the leaves, powerful or faint aroma, erect or prostrate habit, both northern and southern form are abundantly variable.—Smooth, glabrous, herbaceous, aromatic, generally maritime plants, with decompound leaves and erect or prostrate, branching, leafy stems. *Umbels* many-flowered, simple or compound, without involucre or involucel. *Calyx*-limb obsolete. *Petals* without an inflected apex. *Fruit* didymous, laterally compressed; *mericarps* with five ribs, and one to three vittæ in the interstices. (Name of dubious origin.)

1. **Apium australe** (Pet. Thouars, Fl. Trist. d'Acunha, 43); caule sulcato prostrato et radicante v. erecto, foliis bipinnatisectis, foliolis sessilibus petiolulatisve bi-multijugis varie incisis dentatis lobatisve, umbellis simplicibus sessilibus v. pedunculatis et compositis, fructibus jugis crassis.—*Fl. N. Zeal.* i. 86.

Var. *α*; caule suberecto v. prostrato, foliolis late obovatis varie sectis.—A. graveolens, *Forst. Prodr.; DC.* v. 101. *in part.; Fl. Ant.* ii. 287. (*Gunn,* 386.)

Var. *β* (Fl. N. Zeal. i. 86); caulibus prostratis, foliorum segmentis anguste linearibus.—A. pro-

stratum, *Lab. Pl. Nov. Holl.* i. 76. *t.* 103; *Vent. Hort. Mal. t.* 81. Petroselinum prostratum, *DC. Prodr.* iv. 102, 387; *Hook. Ic. Pl.* cccv. (*Gunn*, 68.)

Hab. Common, especially on the north shores of the Island.—(Fl. Nov.) (*v. v.*)

Distrib. Extratropical Australia, both on the coast and inland; New Zealand, Fuegia, and the Falkland Islands; Tristan d'Acunha and St. Paul's Island (in the South Indian Ocean).

The two varieties of this plant appear totally dissimilar. The differences are extreme between the short, broad, obovate, cuneate segments of var. *α*, and the long, narrow, linear ones of var. *β*; but not only are intermediate forms abundant, but one of Gunn's specimens of *β* has leaves of *α* occurring at the same node with its own. —A suberect or prostrate herb, sometimes rooting at the joints. *Branches* a few inches to a foot long, leafy. *Leaves* bipinnatisect. *Umbels* peduncled and simple, sessile and compound.—It would be worth while to cultivate this plant, to discover whether, after several years of good soil and manure, it would not become a good Celery. In the wet climate of Fuegia it makes an agreeable raw salad and cooked potherb.

Gen. XI. DAUCUS, *Tourn.*

Fructus a dorso compressus, oblongus, calycis limbo 5-dentato coronatus; mericarpiis plano-convexis, jugis primariis 5, setosis, 3 dorsalibus, 2 sutura commissurali impositis; secundariis 4, prominulis, aculeatis; valleculis vittatis. *Semen* antice planiusculum. *Petala* apice inflexa; exteriora sæpe radiantia.—Herbæ *plerumque erectæ;* foliis *pinnatisectis;* umbellis *compositis;* involucri foliolis *simplicibus v. pinnatifidis.*

This European genus, to which the Carrot belongs, has but one Australian representative, which is also found in the New World; its prickly fruit and finely divided leaves at once distinguish it from all other plants of the same family in Tasmania. The technical characters of the genus reside in the dorsally compressed fruit, with five primary and four secondary ridges on each mericarp; the primary are covered with setæ, and the secondary with strong prickles.—*Calyx-lobes* obscure. *Petals* with an incurved apex. (Name, δαυκος in Greek.)

1. **Daucus brachiatus** (Sieb. Pl. Exsicc. p. 115); erectus, ramosus, pilosus v. glabratus, foliis bipinnatisectis, segmentis incisis ultimis linearibus, umbellis pauciradiatis radiis inæquilongis, foliolis involucri linearibus v. foliaceis involucelli simplicibus pedicellis brevioribus, petalis minimis rubris, jugis secundariis fructus pectinatis, aculeis primariis apice glochidiatis.—*DC. Prodr.* iv. 214; *Fl. N. Zeal.* i. 91. D. toriloides, *DC. l. c.* D. australis, *Pœpp. Pl. Exs.* 97; *DC. l. c.* D. pusillus, *Michaux, Fl. Bor. Am.* i. 164. D. microphyllus, *Presl; DC. l. c.* 213. Caucalis glochidiata, *Poiret, Suppl.* ii. 137. Scandix pectinata, *Lab. Fl. Nov. Holl.* i. 75. *t.* 102. (*Gunn*, 493.)

Hab. Common in the northern parts of the Island.—(Fl. Dec.)

Distrib. Eastern Australia, from the Tropics to Bass' Straits; South-western Australia; New Zealand; Western America from Mexico to Juan Fernandez.

Plants glabrous or pilose. *Stems* simple, or many from the same root, 6 inches to 1 foot high, slender in flower, stout in fruit. *Leaves* chiefly radical, decompound; the ultimate segments small, narrow-linear. *Umbels* axillary and terminal, of eight to ten unequal rays. *General involucre* simple or decompound. *Petals* small, scarlet. *Carpels* 1 line long, the main ridges with a row of stiff, barbed bristles, the intermediate ones much smaller, two hidden in the commissure, each with a double row of bristles pointing right and left.

Gen. XII. OREOMYRRHIS, *Endl.*

Fructus ovato-oblongus, lateraliter subcompressus, calycis limbo truncato coronatus; mericarpiis 5-jugis, jugis obtusis prominulis, 3 dorsalibus, 2 marginalibus; valleculis 1-vittatis. *Semen* antice planiusculum v. concavum. *Petala* apice incurva. *Styli* recurvi.—Herbæ *glabratæ v. sericeæ;* foliis *decompositis;* scapis *erectis simplicibus v. proliferim ramosis;* umbellis *simplicibus;* involucri foliolis *linearibus.*

The majority of the species of this genus are South Australian and Tasmanian; a few only are New Zealand and South American. In the New Zealand Flora I have pointed out that the structure of the seed has been misunderstood, and that, being plane or only slightly concave in front (not, as has been described, convolute or deeply grooved), the genus belongs to the tribe *Seselineæ*. I much doubt whether all the species here described are different from one another, but as I do not know how to divide them better, I have followed Mr. Gunn's numbers.—*Herbs*, glabrous or often very silky in all parts. *Leaves* all radical, decompound, finely cut. *Scapes* erect, simple or proliferously branched, bearing one simple umbel of sessile or pedicelled flowers, surrounded with a many-leaved involucre. *Calyx-limb* obsolete. *Petals* often hairy, with incurved tips. *Styles* short, recurved. *Fruit* elongate, ovate, nearly terete, somewhat laterally compressed; *mericarps* semiterete, each with five blunt ribs and a single row of vittæ in the interstices. (Name from ορος, *a mountain*, and *Myrrhis*, an umbelliferous plant.)

1. **Oreomyrrhis eriopoda** (Hook. fil.); tota appresse cano- v. sericeo-pilosa, foliis lanceolatis bipinnatisectis, segmentis lobatis laciniatisve, scapis gracilibus superne retrorsum pilosis, involucri foliolis oblongo-lanceolatis, fructibus elongatis pedicellis villosis multo brevioribus æquilongisve.—Caldasia eriopoda, *DC. Prodr.* iv. 229. (*Gunn*, 491.)

Hab. Common in grassy pastures, etc., in various localities, both on the mountains and plains, *Gunn*. —(Fl. Oct., Nov.)

Distrib. New South Wales and South-eastern Australia.

Whole plant 6–18 inches high, covered everywhere except on the fruit with rather silky hairs, which are retrorse on the upper part of the scape, but appressed elsewhere. *Leaves* on slender petioles, lanceolate, bipinnatisect, the pinnules finely cut into narrow laciniæ. *Scapes* proliferously branched in Victoria specimens and leafy at the axils. *Fruit* elongate-ovate, on stout, villous pedicels as long as or much longer than themselves.—Dr. Mueller sends a state of this plant from Victoria with very long, narrow-linear fruit, three or four times as long as the pedicels.

2. **Oreomyrrhis brachycarpa** (Hook. fil.); sericeo-pilosa, foliis linearibus lineari-lanceolatisve bipinnatisectis, fructibus breviter ovatis pedicellis villosis brevioribus subæquilongisve.—Caldasia brachycarpa, *Nob. in Hook. Ic. Pl. sub t.* ccc. (*Gunn*, 882.)

Hab. Elevated parts of the Colony, as at Middlesex Plains, St. Patrick's River, and Lake St. Clair, *Gunn*.—(Fl. Dec.)

Intermediate between *O. argentea* and *O. eriopoda*, having the silky pubescence less shining than in the former, and more so than in the latter. *Fruit* much shorter, and leaves smaller and narrower, than in *O. eriopoda*.

3. **Oreomyrrhis argentea** (Hook. fil.); robusta, tota dense argenteo-sericea et villosa, foliis linearibus bipinnatisectis nitidis, involucri foliolis ovatis obtusis, fructibus sericeis ovatis pedicellis villosis brevioribus. —Caldasia argentea, *Nob. in Hook. Ic. Pl. t.* ccc. (*Gunn*, 823.)

Hab. Mountainous parts of the Colony, 3–4000 feet, Middlesex Plains, Lake Echo, etc., *Gunn*.—(Fl. Nov., Dec.)

A very beautiful, short, robust, alpine species, readily distinguished from *O. brachycarpa*, to which it is nearly allied, by the shining, villous, silky, and silvery foliage, scapes, and pedicels.

4. **Oreomyrrhis sessiliflora** (Hook. fil. in Lond. Journ. Bot. vi. 471); laxe pilosa, foliis lanceolatis linearibusve pinnatisectis, foliolis ovato-oblongis pinnatifidis pilosis glabratisve, segmentis lanceolatis linearibusve acuminatis integris lobatisve, scapis simplicibus v. subumbellatim proliferis, involucri foliolis lineari-oblongis basi coadunatis, fructibus brevissime pedicellatis lineari-elongatis glabris sericeisve. (*Gunn*, 326.)

Hab. Summit of Ben Lomond and of the Western Mountains, elev. 4–5000 feet, *Gunn*.—(Fl. Jan.)

A more glabrous plant than any of the preceding, with less compound leaves, and often prostrate scapes that are umbellately, proliferously branched. The long, almost sessile fruits, distinguish it well.

5. **Oreomyrrhis ciliata** (Hook. fil. in Lond. Journ. Bot. vi. 471); laxe pilosa v. glabrata, foliis linearibus lanceolato-oblongisve pinnatisectis pinnulis multijugis ovatis lineari-ovatisve laciniatis inciso-pinnatifidisve, segmentis ciliatis, scapo superne retrorsum piloso, umbellis simplicibus, involucri foliolis brevibus ovatis subacutis ciliatis, pedicellis elongatis pilosis, fructibus elongato-ovatis glaberrimis. (*Gunn*, 824.)

Hab. Subalpine places, St. Patrick's River, Arthur's Lakes, and Middlesex Plains, *Gunn.*—(Fl. Nov.)

This, in its usual form, is a smaller species than any of the preceding, with narrower, linear, simply-pinnatisect, glabrous or appressed-pubescent leaves, the pinnules deeply laciniate, or pinnatifid, with cartilaginous margins. *Scapes* simple. *Umbels* with broad involucral leaflets. *Fruit* on long pedicels, elongate-ovate, glabrous.—Mr. Gunn and Dr. Milligan have each sent a single specimen of what I take to be a state of this species, from limestone rocks at the Gordon River, Macquarrie Harbour, with much broader, bipinnatisect leaves, covered with spreading hairs.

Nat. Ord. XXXIX. ARALIACEÆ.

Gen. I. PANAX, *L.*

Flores polygami v. dioici, cum pedicello articulati. *Calycis* limbus brevissimus, 5-dentatus. *Petala* 5, margine calycis inserta. *Stamina* 5. *Ovarium* 2–4-loculare. *Styli* 2–4. *Bacca* compressa, orbiculata v. didyma, 2–4-locularis; loculis 1-spermis.—Fruticuli, frutices *v.* herbæ; foliis *plerumque 3–5-foliolatis;* petiolis foliolisque *articulatis;* umbellis *simplicibus v. deformatis;* floribus *plerisque unisexualibus, viridibus.*

The *Araliaceæ*, which are most frequent in humid forests, are extremely rare in Australia, in which respect this country contrasts remarkably with New Zealand. The eight or ten Australian species known are confined to the eastern coasts and northern tropical parts of the Continent. Two have been found by the indefatigable Dr. Mueller in Victoria. The genera of the Order are now under revision by Decaisne and Planchon, who propose publishing a monograph of it. *Panax* is characterized by its usually unisexual flowers, which are jointed on to the pedicel, five-toothed calyx, five petals, as many stamens, two to four styles, and the same number of cells in the ovary, and its baccate fruit. (Name from παν, *everything*, and ακος, *a remedy;* on account of the supposed virtues of some species.)

1. **Panax Gunnii** (Hook. fil. in Lond. Journ. Bot. vi. 466); frutex v. fruticulus, ramis gracilibus, ramulis petiolis pedunculisque strigoso-hirtis, foliis petiolatis junioribus digitatis 5–7-foliolatis, foliolis plantis junioribus grosse inciso- v. lobato-serratis pinnatifidisve, senioribus sessilibus lanceolatis acuminatis grosse serratis, pedunculis terminalibus petiolis subæquilongis, umbellis multifloris, floribus gracile pedicellatis parvis, calycis dentibus acutis, petalis late ovatis, stylis 2 brevibus erectis. (*Gunn*, 1254.) (Tab. XXXVII.)

Hab. Road to Macquarrie Harbour, between the Franklin and Gordon Rivers, in dense forests by the Acheron River, etc., *Milligan, Gunn.*—(Fl. Feb.–April.)

A very small, slender, sparingly-branched bush, 2–3 feet high, with flexible, terete, almost leafless stems and branches; the latter, as well as the petioles, peduncles, and pedicels, covered with appressed, rather rigid hairs or setæ that turn brown when dry. *Leaves* very different in the young and old states of the plants, on slender petioles, digitate; those on young plants have five to seven sessile or petiolulate, spreading leaflets, 1–2 inches long, leaflets narrow, lanceolate, inciso-serrate or irregularly pinnatifidly lobed, lobes sometimes long and cut or toothed;

leaflets on old plants smaller, three to five, sessile, lanceolate, acuminate, coarsely bluntly toothed, midrib sometimes setose. *Umbels* on slender, terminal peduncles, many-flowered. *Flowers* very inconspicuous, green, small.—PLATE XXXVII. Fig. 1, flower; 2, petal; 3, ovary; 4, young fruit:—*all magnified.*

NAT. ORD. XL. CAPRIFOLIACEÆ.

Of the Family *Caprifoliaceæ*, including *Corneæ*, there are only two or three Australian representatives; these are chiefly species of *Polyosma* and *Sambucus*. The allied Family of *Loranthaceæ* (including the Misletoes) may be mentioned here as possessing about a dozen Australian species of *Viscum*, and thirty to forty of *Loranthus*; several of these advance as far south as Bass' Straits, but none have hitherto been found in Tasmania, which is somewhat remarkable.

Gen. I. SAMBUCUS, *L.*

Calycis limbus parvus, 5-fidus. *Corolla* rotata, 3–5-fida, lobis obtusis. *Stamina* 3–5. *Ovarium* 3–5-loculare, loculis 1-ovulatis; ovulis pendulis. *Stigmata* 3–5. *Bacca* calycis limbo coronata, pulposa.—Frutices *v.* herbæ; foliis *oppositis, impari-pinnatisectis, pinnis dentatis v. varie sectis basi bistipulatis v. biglandulosis;* floribus *corymbosis.*

The species of *Sambucus* are found in many parts of the world, both tropical and temperate. Only two are Australian, and both are confined to the south-east quarter of the Continent, one advancing into North Tasmania. It is probable that the berries may afford as good a wine as that of their congener, the Elder-berry; they have been used for puddings.—*Calyx-tube* adnate with the ovary; *limb* free, five-toothed or lobed. *Petals* five, united into a monopetalous corolla, with imbricate æstivation. *Stamens* five. *Ovary* 3–5-locular. (Name from *sambuca*, a musical instrument which was made from the wood of the genus.)

1. **Sambucus Gaudichaudiana** (DC. Prodr. iv. 322); suffruticosa, glabra, foliis pinnatisectis, pinnis sessilibus petiolulatisve 2–5-jugis supremis liberis coadunatisve oblongo-lanceolatis acuminatis basi inæqualibus æqualibusve grosse dentatis, stipulis foliaceis late ovatis serratis, corymbo pedunculato composito, radiis subumbellatis. (*Gunn*, 19.)

HAB. Dense, shaded woods, ravines, and alluvial flats in the northern parts of the Colony, *Gunn.*—(Fl. Dec.)

DISTRIB. New South Wales and Victoria.

A branching, glabrous, herbaceous undershrub, 3–5 feet high, with perennial roots and annual shoots. *Leaves* a span and more long, pinnatisect, the pinnules 2–5 inches long, oblong-ovate or lanceolate, acuminate, sessile or petiolulate, oblique or cordate or acute or blunt or very unequal at the base, coarsely, sharply toothed, the uppermost free or united at their bases. *Stipules* foliaceous, broad, coarsely serrate. *Corymbs* terminal, much branched, branches somewhat umbellate. *Flowers* very numerous, white; petals three to five, often unequal. *Berries* oblong, compressed, white, usually two- or three-celled, and two- or three-seeded.

NAT. ORD. XLI. RUBIACEÆ.

The paucity of genera in this enormous and universally distributed Natural Order is one of the most marked peculiarities in the Australian Flora; for with the exception of *Anthospermæ*, with which *Opercularieæ* may be associated, and some *Stellatæ*, all included in *Asperula* and *Galium*, there are not more than fifty known species of the Order in Australia. Those that are known are almost all tropical, and many of them common weeds in other countries.

Gen. I. COPROSMA, *Forst.*

Flores diclines v. polygami. *Calycis* tubus ovatus; limbus superus, 4–5-dentatus. *Corolla* tubulosa v. subcampanulata, limbo 4–5-lobo. *Stamina* 4–5, imo corollæ inserta; filamentis longe exsertis; antheris lineari-oblongis, connectivo ultra loculos producto. *Ovarium* 2–4-loculare; loculis 1-ovulatis; *stylis* 2, filiformibus, elongatis, exsertis, undique piloso-stigmatiferis. *Bacca* ovoidea v. globosa, pulposa. *Semina* 2 (rarius plura), plano-convexa. *Embryo* axi albuminis cornei orthotropus; *radicula* tereti, hilo proxima; *cotyledonibus* foliaceis.—Frutices *sæpissime fœtidissimi, sempervirentes, habitu varii;* floribus *viridibus, sessilibus v. pedicellatis, solitariis v. in capitula pedunculata dispositis;* baccis *rubris, sæpe edulibus.*

This is eminently a Polynesian genus, the species of which are excessively variable: the majority of them inhabit New Zealand, where they constitute one of the largest genera of flowering plants. The few Australian species are also Tasmanian.—*Shrubs*, sometimes creeping, small, and alpine, with evergreen, often fœtid, foliage, and deciduous stipules. *Flowers* solitary or capitate, sessile or pedicelled, axillary, inconspicuous, white or greenish, often unisexual. *Calyx*-tube adnate with the ovary, its limb free, four- or five-lobed. *Corolla* funnel-shaped, tubular or campanulate, with four or five valvate lobes, and a long or short tube. *Ovary* two-celled, rarely four-celled, with two long, exserted, filiform styles, covered throughout their length with stigmatic hairs. *Stamens* four to nine; filaments inserted at the base of the tube of the corolla, exserted, flexuose. *Anthers* linear, pendulous, the connective produced into a short point at their apex. *Berry* usually red, two-celled, two-seeded, rarely four-seeded. *Seeds* with horny albumen, plano-convex. **(Name from the fœtid odour of some species.)**

1. **Coprosma hirtella** (Lab. Fl. Nov. Holl. i. 70. t. 95); fruticosa, robusta, foliis rigide coriaceis petiolatis obovatis lanceolatisve cuspidatis superne scaberulis, stipulis late ovatis, capitulis axillaribus, floribus 3–10 subsessilibus tetrameris.—*Nob. in Lond. Journ. Bot.* vi. 465; *DC. Prodr.* iv. 578. C. cuspidifolia, *DC. l. c.* (*Gunn*, 10.)

Hab. Abundant in rocky places throughout the Colony.—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia: New South Wales and Victoria.

A rigid, evergreen shrub, 3–5 feet high, growing in unisexual clumps. *Branches* angled, strict, woody, scabrous. *Leaves* very coriaceous, 1–1½ inch long, obovate or lanceolate, very rigid, cuspidate, scabrous above, narrowed into a short petiole. *Stipules* broadly ovate, often cleft into several teeth. *Flowers* aggregated in small, axillary heads. *Berries* red or amber-coloured.

2. **Coprosma Billardieri** (Hook. fil. in Lond. Journ. Bot. vi. 465); fruticosa, ramulis puberulis gracilibus virgatis subdistiche ramulosis sæpe spinescentibus, foliis parvis ovatis oblongis lanceolatisve acutis utrinque glaberrimis submembranaceis, floribus solitariis tetrameris.—C. microphylla, *A. Cunn. MSS.* Canthium quadrifidum, *Lab. Fl. Nov. Holl.* i. *t.* 94. Marquisia Billardieri, *DC. Prodr.* iv. (*Gunn*, 219.)

Hab. Common by the banks of streams in a rich soil, in shaded ravines and dense forests. Colonial name, "Native Currant."—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to Victoria.

A slender, branched, small-leaved, twiggy shrub, 6–12 feet high, upon which the only Tasmanian epiphytic orchid, *Gunnia*, is generally found at Emu Bay. *Branches* very slender, strict, pubescent; the lateral divaricating, somewhat distichous, often spinescent. *Leaves* numerous, extremely variable in size and shape, ¼–1 inch long, shortly petiolate, ovate-lanceolate, oblong or oblong-lanceolate, acute, membranous, quite glabrous. *Flowers* small, solitary, axillary. *Berries* red, not unpleasant, of the size of a small currant.

3. **Coprosma nitida** (Hook. fil. in Lond. Journ. Bot. vi. 465); frutex erectus robustus ramosus,

ramis ramulisque puberulis, foliis parvis coriaceis nitidis brevissime petiolatis elliptico-lanceolatis oblongisve obtusis subacutisve enerviis marginibus recurvis, floribus solitariis 4-fidis. (*Gunn,* 874.) (Tab. XXXIX.)

Hab. Common on the mountain-tops and in open alpine situations generally, *Gunn.*—(Fl. Jan.) (*v. v.*)

An erect, rigid, woody shrub, 5–6 feet high, with stiff, puberulous branches, generally densely covered with leaves. *Leaves* $\frac{1}{3}$–$\frac{2}{3}$ inch long, shortly petioled, very coriaceous and shining above, lanceolate or elliptic-lanceolate, blunt, with recurved margins. *Stipules* transverse, truncate. *Flowers* solitary, sessile, tetramerous. *Berries* pale orange-red, refreshing, and of service in allaying thirst.—Plate XXXIX. *A.* Branch with female flower; and *B.* Branch with fruit. Fig. 1, stem, leaf, and stipule; 2, male flower; 3, female ditto; 4, berry; 5, transverse section of ditto; 6, seed:—*all magnified.*

4. **Coprosma pumila** (Hook. fil. in Lond. Journ. Bot. vi. 465); fruticulus repens glaberrimus v. foliis junioribus puberulis, ramulis brevibus suberectis foliosis, foliis parvis lineari- v. elliptico-obovatis lanceolatisve obtusis acutisve rigidis coriaceo-carnosis in petiolum brevem angustatis, floribus (pro planta magnis) sessilibus axillaribus, calyce brevi 4-fido, corolla tubulosa 4-fida.—*Fl. N. Zeal.* i. 111; *Fl. Antarct.* i. *t.* 16 *B. sub nom.* C. repens. (*Gunn,* 304.)

Hab. Middlesex Plains, and on all the mountain-tops, abundant, *Gunn.*—(Fl. Feb.)

Distrib. Victoria, Mount Kosciusko, elev. 6000 feet, *Mueller;* mountains of New Zealand.

A small, densely matted, creeping species, with stout, much branched, spreading, prostrate, often flexuose, densely leafy branches, the younger pubescent. *Leaves* very thick and coriaceous, bright green and shining, shortly petiolate, linear or elliptic-obovate or lanceolate, sharp or blunt, $\frac{1}{4}$–$\frac{1}{2}$ inch long, margins recurved, the petioles connate with the stipules at the base, and forming together a sheath. *Flowers* solitary, sessile. *Calyx-lobes* very short. *Corolla* nearly as long as the leaves, tubular, curved, four-cleft at the mouth. *Stamens* very much exserted, with long, pendulous anthers, hooked at the apex. *Berries* red, two-celled, two-seeded.

Gen. II. OPERCULARIA, *A. Rich.*

Flores dioici v. hermaphroditi, in capitula globosa concreti. *Calycis* limbus 3–4-lobus. *Corolla* infundibuliformis v. campanulata, 3–5-fida. *Stamina* 1–5. *Styli* 2, elongati, per totam longitudinem piloso-stigmatiferi. *Ovaria* 2-locularia, loculis 1-ovulatis. *Baccæ* in capitulum concretæ, biloculares, loculis dispermis, lobis calycinis persistentibus coronatæ. *Semina* solitaria, oblonga, dorso convexa, facie 3-jugata.—Herbæ *basi suffruticulosæ;* foliis *utrinque stipulatis;* capitulis *terminalibus v. e axillis ramulorum sessilibus pedunculatisve;* involucro *generali nullo v. e stipulis foliisque parvis concreto, partiali gamophyllo,* 8–10-*dentato.*

A remarkable genus, which, together with another Australian genus (*Pomax*), has been placed in a tribe of *Rubiaceæ*, at the end of the Order, but which I consider as appertaining to *Anthospermeæ*. About twenty species are known, of which more than half are natives of South-western Australia and the remainder of South-eastern, none being tropical.—*Herbs*, with the stems often shrubby at the base. *Branches* erect or prostrate, slender, sparingly branched. *Leaves* opposite, with interpetiolar stipules. *Flowers* hermaphrodite or diœcious, collected into sessile or peduncled, involucrate capitula. *Calyces* confluent below, each with a three- or four-toothed limb. *Corolla* campanulate or funnel-shaped, three- to five-lobed. *Stamens* with long filaments and oblong anthers. *Styles* two, elongated, exserted, covered with stigmatic hairs. *Fruits* aggregated into a fleshy mass by the cohesion of the bases of the tubes of the calyces, their upper parts often separating like an operculum; two-celled, cells one-seeded. *Seeds* oblong, plano-convex, with three prominent ridges on the inner face. (Name from *operculum*, a lid; in allusion to the dehiscence of the fruits.)

1. **Opercularia ovata** (Hook. fil. in Lond. Journ. Bot. vi. 465); glabriuscula, ramosa, ramis gra-

cilibus prostratis ascendentibusve subflaccidis glabris, foliis petiolatis ovatis obtusis subacutisve ciliatis utrinque glabratis parce pilosisve submembranaceis, capitulis axillaribus breviter pedunculatis, floribus hermaphroditis (dioicisve) 3–4-andris, calycis lobis 3 oblongis ciliatis, corolla infundibuliformi, filamentis stylisque longe exsertis, baccis infra medium inter se et cum involucro coalitis. (*Gunn*, 78.) (Tab. XXXVIII.)

Hab. Launceston, on stiff clay soil, *Gunn.*—(Fl. Nov., Dec.)

Distrib. Victoria, *Mueller, Robertson.*

Whole plant stinking abominably when bruised, forming patches from a few inches to a square foot broad. —*Stems* numerous, slender, spreading, prostrate or ascending, 3–6 inches long, branched, leafy. *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ inch long, shortly petioled, ovate, oblong-ovate, or lanceolate, subacute. *Flowers* dioecious according to Gunn, but decidedly hermaphrodite in some of my specimens, united by the bases of their calyces, together with the involucre, into a shortly peduncled axillary capitulum. *Calyx-lobes* three, ciliate, erect. *Corolla* funnel-shaped, four-lobed. *Styles* and filaments long, exserted.—Plate XXXVIII. *A.* flowering, and *B.* fruiting specimens. Fig. 1, capitulum; 2, corolla and limb of calyx; 3, head of fruits; 4, longitudinal section of part of a fruit; 5 and 6, seeds:—*all magnified.*

2. **Opercularia varia** (Hook. fil. in Lond. Journ. Bot. vi. 466); pusilla, hispido-pilosa v. glabrata, caulibus e radice lignosa perplurimis gracilibus erectis decumbentibusve angulatis, foliis parvis brevissime petiolatis rigide coriaceis linearibus lineari-oblongis ovatisve obtusis acutisve utrinque hispido-pilosis scabridis lævibusve, vaginis brevissimis, capitulis axillaribus breviter pedunculatis, corolla late infundibuliformi calycis lobis subulatis æquilonga, staminibus 2.

Var. *α. hispidula;* foliis majoribus scaberulis lineari-oblongis obtusis, ramis diffusis.

Var. *β. scabrida;* hispido-pilosa, foliis ovatis oblongisve obtusis, ramis suberectis diffusisve. (*Gunn*, 882.)

Var. *γ. filiformis;* glaberrima v. glabrata, nitida, foliis linearibus acutis, ramis ascendentibus acutisve. (*Gunn*, 546.)

Hab. Very common in dry, stony places throughout the Colony.—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia.

A smaller species than *O. ovata*, equally offensive in smell, with much narrower leaves; smooth, scabrid, hispid, or pilose.—*Stems* very numerous from the root, slender, branched, erect, ascending or prostrate, 2–6 inches long. *Leaves* generally linear, rigidly coriaceous. *Flowers* in small axillary heads. *Calyx*-lobes subulate, as long as the short funnel-shaped corolla. *Stamens* two.—This is a very variable species.

Gen. III. NERTERA, *Banks et Sol.*

Flores hermaphroditi. *Calycis* tubus ovoideus; limbus truncatus v. obscure 4-dentatus. *Corolla* tubulosa v. infundibuliformis, 4-loba. *Stamina* 4; filamenta basi corollæ inserta; antheris longe exsertis. *Ovarium* 2-loculare; loculis 1-ovulatis. *Styli* 2, elongati, undique piloso-stigmatiferi. *Bacca* rotundata, carnosa, dicocca; coccis coriaceis, 1-spermis. *Semina* plano-convexa, intus sulcata.—Herbæ *parvæ, repentes;* foliis *sempervirentibus;* stipulis *intrafoliaceis;* floribus *axillaribus, subsessilibus.*

This little genus is placed in the Tribe *Guettardeæ* by De Candolle, but is, I think, undoubtedly closely allied to *Coprosma*, from which it scarcely differs, except in the hermaphrodite flowers, and coriaceous cocci in the berry: there are several species, chiefly natives of New Zealand. (Name from νερτερος, *lowly;* in allusion to the habit of growth.)

1. **Nertera depressa** (Banks et Sol. in Gærtn. Fruct. i. 124. t. 26); glaberrima, caule repente, ramulis suberectis v. demissis, foliis petiolatis late ovatis acutis, calycibus ovariisque glaberrimis.—*DC.*

Prodr. iv. 451; *Smith, Ic. ined.* ii. *t.* 28; *Tratt. Arch.* iii. *t.* 129; *Fl. Antarct.* i. 23; *Fl. N. Zeal.* i. 112. N. repens, *Ruiz et Pavon, Fl. Per.* i. 60. *t.* 90. Erythrodamum alsinæforme, *Pet. Thouars, Fl. Trist. d'Acunha, p.* 42. *t.* 10. Gomozia Granatensis, *Mut. in Linn. fil. Suppl.* 29. (*Gunn,* 1252.)

Hab. By springs on the summit of the Western Mountains, *Gunn.*—(Fl. Dec.) (*v. v.*)

Distrib. New Zealand; Lord Auckland's and Campbell's Islands; South America, from New Granada to Cape Horn and the Falkland Islands; Tristan d'Acunha.

Everywhere quite glabrous.—*Stems* obscurely tetragonous, creeping and rooting, a span to 2 feet long. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ inch long, on petioles sometimes as long as the blade, broadly ovate, blunt or subacute, coriaceous or fleshy, shining, deep green. *Flowers* small and inconspicuous, sessile and axillary. *Stamens* exserted; anthers broadly ovate. *Berries* amber-red according to Gunn, bright orange-red in South American specimens. I have seen no Tasmanian specimens but Gunn's fruiting ones.

Gen. IV. ASPERULA, *L.*

Flores hermaphroditi v. polygamo-dioici. *Calycis* tubus globosus v. oblongus; limbo 0. *Corolla* infundibuliformis v. campanulata, plerumque 4-partita. *Stamina* 4. *Stylus* erectus, bipartitus, stigmatibus capitatis. *Fructus* didymus, subrotundus, siccus, indehiscens, 2-locularis, 2-spermus.—Herbæ *graciles, di-trichotome ramosæ;* caulibus *angulatis;* foliis *parvis, verticillatis;* floribus *cymosis.*

A very large European genus, less common in other temperate countries. About a dozen Australian species are known, all confined to the south-eastern quarter and Tasmania.—Slender, di-trichotomously branching herbs, with four-angled stems and whorled leaves. *Flowers* cymose, hermaphrodite or unisexual, the stamens being frequently imperfect in the female flowers, and the ovaries, etc., in the males; in the male flower the corolla is generally longer than in the female, and the style shorter. *Calyx-tube* globose, or didymous, or oblong; limb none. *Corolla* funnel or bell-shaped, with four spreading, valvate lobes. *Stamens* four. *Style* erect, bifid, armed with capitate stigmata. *Fruit* coriaceous, two-celled, two-seeded, indehiscent. (Name from *asper*, rough; in allusion to the hispidity of some species.)

§ 1. *Leaves always quaternate.*

1. **Asperula subsimplex** (Hook. fil. Lond. Journ. Bot. vi. 463); glaberrima, caule gracili suberecto simplici v. ramoso, foliis quaternis anguste linearibus obtusis subacutisve marginibus recurvis rarissime remote scaberulis, pedunculis in axillis supremis solitariis binis ternisve 1–3-floris. (*Gunn,* 882, 407.)

Hab. Circular Head, Formosa, and Lake St. Clair, *Lawrence, Gunn.*—(Fl. Dec.)

An erect and apparently tufted species, 3–6 inches high, generally quite glabrous, or slightly pubescent towards the tips. *Stems* slender, simple, or sometimes much branched. *Leaves* generally shorter than the internodes, $\frac{1}{6}$–$\frac{1}{4}$ inch long, narrow-linear, narrowed at both ends, usually acuminate, quite glabrous, or with a few scattered, scabrid points towards the edges. *Cymes* few-flowered; peduncles as long as the leaves, rarely longer. *Corolla* bell-shaped, perfectly glabrous, with short, blunt lobes.

§ 2. *Leaves quaternate and senate on the same individual.*

2. **Asperula Gunnii** (Hook. fil. Lond. Journ. Bot. vi. 463); glabriuscula, caule decumbente ramoso, ramis erectis ad angulos hispido-scaberulis, foliis quaternis senisque inæqualibus lineari-obovatis lineari-oblongisve utrinque lævibus marginibus recurvis obscure scaberulis, pedunculis in axillis superioribus solitariis v. pluribus 1–3-floris. (*Gunn,* 1123.)

Hab. Alpine situations, not unfrequent; Hampshire Hills, Arthur's Lakes, Lake St. Clair, Mount Wellington, Nive River, *Lawrence, Gunn.*—(Fl. Jan.) (*v. v.*)

Distrib. New South Wales: Appin, *Backhouse.*

Whole plant generally quite glabrous and shining, the angles of the stems sometimes a little scabrid. *Stems* decumbent, branched, 1–10 inches long. *Leaves* scattered, broader than in any other Tasmanian species, ¼–⅓ inch long, linear-obovate or oblong, acute, with recurved margins, that are sometimes slightly scabrid. *Cymes* solitary or crowded, very short, few-flowered. *Corolla* with a rather long tube.

§ 3. *Leaves senate.*

3. **Asperula scoparia** (Hook. fil. in Lond. Journ. Bot. vi. 463); caule decumbente e basi ramoso, ramis ascendentibus pilis brevibus hispidis, foliis senis anguste linearibus patenti-recurvis in apicem piliferum acuminatis marginibus recurvis setoso-ciliatis, pedunculis in axillis supremis confertis folio brevioribus, floribus hermaphrodito-dioicis, corollæ tubo gracili. (Tab. XL. *A.*)

Hab. Dry gravelly fields at Laurenny.—(Fl. Oct.) (*v. v.*)

Distrib. Appin, New South Wales, *Backhouse.*

An erect or decumbent, much fasciculately-branched species, 2–6 inches high. *Stems* much furrowed, hispid, pubescent, decumbent, with ascending short branches. *Leaves* spreading, sometimes a little recurved, very narrow-linear, rigid, with an acuminate hair point; margins strongly recurved, hispid. *Cymes* very short, crowded towards the tips of the branches, few-flowered. *Flowers* unisexual; males with long funnel-shaped corollas, large anthers, and included style; females with shorter corollas, imperfect small stamens, and exserted arms of the style.—Plate XL. *A.* Fig. 1, portion of branch and leaves; 2, male flower; 3, female flower; 4, the same, laid open; 5, ovary and style:—*all magnified.*

4. **Asperula conferta** (Hook. fil. Lond. Journ. Bot. vi. 464); glabriuscula, caulibus confertis ascendentibus glaberrimis v. obscure scaberulis, foliis senis patenti-recurvis anguste linearibus acutis acuminatisve marginibus recurvis ciliato-scaberulis, pedunculis brevissimis in axillis supremis fasciculatis, floribus hermaphrodito-polygamis, corolla infundibuliformi.

Var. *α*; internodiis folio longioribus, caule elongato. (*Gunn*, 159.)

Var. *β*; internodiis folio brevioribus, caule brevi. (*Gunn*, 890.)

Hab. Abundant in dry places throughout the Colony, *Lawrence, Gunn.*—(Fl. Sept.–Dec.) (*v. v.*)

Distrib. South-eastern Australia.

The commonest Tasmanian species, nearly allied to *A. scoparia*, but a much larger plant, with usually more glabrous stem, much shorter and broader leaves. *Stems* decumbent, 2–12 inches long, stout or slender, often much tufted, generally quite glabrous. *Leaves* ¼–⅓ inch long. *Flowers* few in a cyme, like those of *A. scoparia.*

5. **Asperula pusilla** (Hook. fil. in Lond. Journ. Bot. vi. 464); hispidula, caulibus decumbentibus confertis cæspitosisve ramosis subrobustis ramisque ascendentibus erectisve scaberulis, foliis senis parvis lineari-obovatis oblongisve obtusis plerumque internodiis longioribus marginibus recurvis utrinque scaberulis, pedunculis brevibus in axillis supremis confertis, floribus hermaphrodito-dioicis, corolla infundibuliformi, tubo brevi latiusculo glaberrimo v. hispidulo. (*Gunn*, 557 *et* 891.) (Tab. XL. *B.*)

Hab. Common in alpine and subalpine situations; St. Patrick's River, Woolnorth, Hampshire Hills, Arthur's Lakes, etc., *Lawrence, Gunn.*—(Fl. Nov.–Jan.) (*v. v.*)

A small, generally densely tufted species, scaberulous all over. *Stems* 3–6 inches long, often robust for the size of the plant, erect or ascending, densely leafy. *Leaves* small, but generally longer than the internodes, linear-obovate or oblong, blunt or subacute, with recurved margins, hispid on both surfaces. *Flowers* crowded in the upper axils, on sub-terminal peduncles, which are shorter than the leaves. *Corolla* with a short tube, that of the male flower rather the longest.—Plate XL. *B.* Fig. 1, portion of stem and leaves; 2, male flower; 3, the same, with the corolla laid open; 5, female flower; 6, fruit:—*all magnified.*

§ 4. *Leaves eight in a whorl.*

6. **Asperula minima** (Hook. fil. in Lond. Journ. Bot. vi. 464); cæspitosa, caulibus gracilibus confertis ramosis erectis ascendentibusve glaberrimis v. hispidulis, foliis senis-octonis minimis confertis anguste lineari-obovatis v. elliptico-oblongis acuminatis apice diaphano superne marginibusque recurvis hispidulis glabratisve, pedunculis terminalibus axillaribusque folio longioribus, corollæ tubo brevi. (*Gunn*, 1251.)

Hab. Common about Georgetown, *Gunn*.—(Fl. Nov.)

Much the smallest Tasmanian species, very densely tufted, forming matted patches.—*Stems* very slender, glabrous, much branched, 3–5 inches long. *Leaves* very minute, $\frac{1}{10}$–$\frac{1}{6}$ inch long, six to eight in a whorl, linear-oblong or obovate-acuminate, with diaphanous points, and recurved margins, glabrous or slightly scabrid on the upper surface. *Flowers* large for the diminutive size of the plant, on terminal and axillary, one- to three-flowered peduncles, longer than the leaves. *Corolla* funnel-shaped, with a short tube.

Gen. V. GALIUM, *L.*

Omnia *Asperulæ*, sed *corolla* rotata v. tubo brevissimo.

This is a much larger European genus than *Asperula*, but with a similar distribution. About twelve Australian species are known, almost confined to the south-east quarter of the Continent and Tasmania; one only has been found in South-west Australia. The genus exactly resembles *Asperula* in all characters but the corolla, which is rotate, or has a very short tube. (Name from γαλα, *milk*, in curdling which a species has been used.)

§ 1. *Leaves quaternate, rarely senate. Fruit glabrous.*

1. **Galium vagans** (Hook. fil. in Lond. Journ. Bot. vi. 461); totum ciliis patentibus subrecurvisve hispido-pilosum, caule elongato gracili vage diffuse ramoso, verticillis remotis, foliis parvis quaternis ellipticis subacutis utrinque hispidulis, pedunculis axillaribus folio longioribus 2- rarius 3-floris, floribus minimis, fructibus glaberrimis. (*Gunn*, 548.)

Hab. Dry bushy places, probably not uncommon.—(Fl. Nov., Dec.)

Distrib. Victoria, *Robertson*; New South Wales, *A. Cunn.*

A slender, straggling species, with sparingly leafy branches, a foot long, more or less covered with slender, rigid, spreading or recurved long hairs. *Leaves* small, much shorter than the internodes, $\frac{1}{4}$ inch long, narrow-elliptical, subacute, more or less hispid on both surfaces. *Peduncles* axillary, becoming much longer than the leaves, slender. *Flowers* and *fruit* both very small.—This plant varies extremely in size, and in the amount of hairiness or hispidity.

2. **Galium ciliare** (Hook. fil. in Lond. Journ. Bot. vi. 461); caulibus brevibus suberectis elongatisve et prostratis vage diffuse ramosis laxe hispido-pilosis, foliis 4–6-nis internodiis brevioribus elliptico-ovatis acutis utrinque v. superne laxe ciliatis, pedunculis folio subæquilongis plerisque trifloris, floribus flavis, ovario glaberrimo.

Var. α; caulibus elongatis. (*Gunn*, 237, 1128.) (Tab. XLI. *A.*)

Var. β; caulibus abbreviatis. (*Gunn*, 492.) (Tab. XLI. *B.*)

Hab. Dry pastures, abundant; Hampshire Hills, Arthur's Lakes, Circular Head, Hobarton.—(Fl. Oct.–Dec.) (*v. v.*)

A common and variable species. *Stems* 2 inches to $1\frac{1}{2}$ foot long, slender, sparingly branched, suberect when short and stout, covered more or less copiously with long spreading hairs. *Leaves* small for the size of the plant, in distant whorls of four, or rarely six, subpetiolate, elliptical-oblong, subacute, more or less pilose on the upper or on both surfaces. *Flowers* apparently a bright yellow, rather larger than is usual in the Tasmanian species of the

genus.—PLATE XLI. *A.* and *B.* Fig. 1, branch, with leaves and inflorescence; 2, flower: 3, the same viewed from above; 4, young fruit:—*all magnified.*

§ 2. *Leaves quaternate. Fruit hispid.*

3. **Galium australe** (DC. Prodr. iv. 609); hispido-pilosa scaberula v. glabrata, caulibus elongatis vage diffuse ramosis ad angulos scaberulis pilosisve, foliis quaternis anguste elliptico-lanceolatis acuminatis lineari-oblongisve superne punctis sparsis asperis subtus glaberrimis, pedunculis floriferis gracilibus 1–3-floris, fructiferis robustis elongatis, fructibus setis elongatis patentibus uncinatis hispidis.—G. australe, *var.* læve, *Mueller.* G. densum, *Nob. in Lond. Journ. Bot.* vi. 461. (*Gunn,* 549.)

HAB. Common in many parts of the Colony, *Gunn.*—(Fl. Nov., Dec.)

DISTRIB. New South Wales, Victoria, and South-west Australia.

I quite agree with Dr. Mueller in referring my *G. densum* to *G. australe*, which is imperfectly described in De Candolle's 'Prodromus.'—A loosely tufted or straggling, wiry, more or less scabrous or hispid plant. *Stems* a few inches to two feet long, branched, rough at the angles. *Leaves* quaternate, narrow elliptic-lanceolate or linear-oblong, acuminate, rough on the upper surface, glabrous beneath. *Peduncles* slender, one- to three-flowered, lengthened and robust in fruit. *Fruit* hispid, with long, spreading, hooked bristles.

4. **Galium squalidum** (Hook. fil. in Lond. Journ. Bot. vi. 462); totum hispido-pilosum, caulibus ascendentibus e basi ramosis pilis patentibus hispidis, internodiis foliis bis terve longioribus, foliis quaternis lanceolatis acutis acuminatisve utrinque v. superne hispidis marginibus recurvis, pedunculis floriferis folio longioribus 1–3-floris, ovariis breviter hispidis. (*Gunn,* 548? 1129.)

HAB. Dry pastures, etc., abundant, *Gunn, etc.*—(Fl. Oct.) (*v. v.*)

DISTRIB. South-eastern Australia.

This will probably prove to be a variety of *G. australe*, from which it differs in its more rigid habit, shorter, smaller leaves, more uniformly hispid, and shorter, denser setæ on the fruit. In some respects it agrees better with De Candolle's character of *G. australe* than the plant I have referred to that species.

5. **Galium albescens** (Hook. fil. in Lond. Journ. Bot. vi. 462); totum pilis mollibus brevibus cano-pubescens, caulibus robustis suberectis parce ramosis, internodiis folio brevioribus æquilongisve, foliis quaternis elliptico-ovatis lineari-oblongisve acutis utrinque molliter hispido-pilosis, pedunculis hispidis axillaribus solitariis unifloris, floriferis brevibus fructiferis validis decurvis, fructibus setis uncinatis hispidis. (*Gunn,* 1130.)

HAB. Rocky places on Mount Wellington, *Gunn.*—(Fl. April.)

This appears to be a very distinct species from any of those previously described; but until those obscure and troublesome genera are carefully studied in their native country, it is impossible to form satisfactory conclusions as to their limits.—Whole plant covered with a rather soft, hispid pubescence, extending over both surfaces of the leaves and the peduncles. *Stems* rather robust, 8–18 inches long, sparingly branched. *Leaves* in rather distant whorls, elliptic-ovate or oblong-acute. *Flowers* usually solitary. *Peduncles* of the fruit decurved, stout.

NAT. ORD. XLII. COMPOSITÆ.

With the exception perhaps of some parts of Africa, no country so large, and possessed of similar climates, is so poor in *Compositæ* as Australia. Instead of being, as it often is, the largest amongst Phænogams, it possesses fewer species than either *Myrtaceæ* or *Leguminosæ*, and presents much less of peculiarity in both genera and species than those Orders do. The number of species hitherto discovered falls considerably below 600; and many of these being represented by single scraps of specimens, or being collected

from one plant, or in only one locality, will doubtless prove bad species, for M. Mueller's beautiful collections have shown us that no reliance can be placed on single or a few specimens, and that in numerous cases many supposed species are referable to one. Of the known species, about 300 are peculiar to South-eastern Australia and Tasmania, and 170 to South-western Australia, besides about 40 common to both, and 50 tropical species. About 50 Australian species have been found in other countries, these being chiefly tropical Indian and Polynesian plants. By much the greater proportion of the Australian *Compositæ* belong to the tribe *Senecionideæ*, which are twice as numerous as the *Asteroideæ*. Of *Vernonieæ*, *Eupatorieæ*, *Cynareæ*, *Labiatifloræ*, and *Cichoraceæ*, there are extremely few species. Amongst the latter tribe, the presence of *Picris hieracioides*, *Sonchus oleraceus*, and *S. asper*, all apparently wild (the two former of which also occur in New Zealand) is very remarkable, as is that of *Soliva anthemifolia*, Br. (*S. acaulis*, F. Muell.), which appears to be identical with a South American species. Another remarkable feature is the number of peculiar genera belonging to the Gnaphalioid group, many of them extremely minute and of very curious organization; these abound in South-western Australia, which, in this Natural Order, as in many others, presents a larger proportion of peculiar genera than any other equally limited portion of the earth's surface.

Tribe I. Asteroideæ, *DC.*

Gen. I. EURYBIA, *Cass.*

Capitulum multiflorum, heterogamum, radiatum, rarius discoideum. *Involucrum* hemisphæricum v. campanulatum, squamis multiseriatis. *Receptaculum* convexum, nudum, alveolatum v. papillosum, subfimbrilliferum. *Fl. radii* 1-seriati, ligulati, fœminei; *disci* tubulosi, hermaphroditi, 5-fidi; antheris breviter caudatis. *Achenium* elongatum, costatum, glabrum, glandulosum, v. sericeum. *Pappus* simplex, setis scabris rigidis, v. duplex setis exterioribus brevioribus.—Frutices *v.* arbores; foliis *alternis;* capitulis *solitariis paniculatisve;* disco *flavo v. purpureo;* radio *albo.*

A very fine genus, confined to Australia and New Zealand. The character afforded by the pappus, as distinguishing *Olearia* from *Eurybia*, is far from being well marked. Sometimes there are only a few outer hairs, at others many, and I do not think that it affords grounds for even an artificial subdivision of the genus. There are not however in Tasmania any of those species of *Olearia*, with large, solitary, broad capitula, that are found in New Zealand and South-eastern Australia, and which look so strikingly different from the commoner forms of *Eurybia*. About sixty Australian and Tasmanian *Eurybiæ* are known, and twelve *Oleariæ;* by far the greater number of these are south-eastern, about a dozen being south-western, and only two or three tropical. The species vary extremely in habit and general appearance, from heath-like shrubs or almost herbaceous plants, to tall trees, with broad leaves; most are scented, often musky. I have however failed in finding any good characters by which to divide the genus into sections, and those proposed here are very arbitrary.—*Shrubs*, *herbs*, or *trees* with alternate leaves, and solitary, axillary, or paniculate capitula. *Capitula* few- or many-flowered; outer flowers in one row, rayed, female; of the disc tubular, five-toothed, hermaphrodite. *Involucre* imbricated in many series of rigid, herbaceous scales. *Receptacle* convex, broad or rather contracted, pitted, or with a few bristles or fimbriæ. *Anthers* with short tails. *Achenium* glabrous, pubescent, glandular, or silky, costate, narrow. *Pappus* of one row of rigid, scabrid bristles, and sometimes a few unequal shorter ones external to them. (Name, that of the *Mother of the Stars*, in Greek mythology; in allusion to the numerous flowers.)

§ 1. *Large shrubs or trees, with large leaves, three or more inches long, covered below with appressed tomentum. Capitula four- to ten-flowered, numerous, panicled.*

1. **Eurybia argophylla** (Cass. Dict. xxxvii. 487); ramulis foliis subtus paniculisque dense appresse sericeo-tomentosis, foliis petiolatis elliptico-lanceolatis acuminatis argute inæqualiter dentatis integerrimisve

superne glaberrimis lucidis, paniculis elongatis polycephalis, capitulis parvis obconicis 8–10-floris, involucro disco ½ breviore squamis laxis sub-10 linearibus obtusis appresse sericeis, ligulis tubum corollæ æquantibus, acheniis parvis glaberrimis sericeisve, pappi setis 1-serialibus subæqualibus fl. disci æquantibus.—*DC. Prodr.* v. 267. Aster argophyllus, *Lab. Nov. Holl. t.* 201; *Sims, Bot. Mag. t.* 1563. (*Gunn*, 220.)

Hab. Common in forests, only in a rich, damp soil, throughout the Island.—(Fl. Nov.) (*r. r.*) (Colonial name, "Musk-tree.")

Distrib. Southern borders of New South Wales, *A. Cunningham*; Cape Otway, *Gunn*. (Cultivated in England.)

A tree, 20–25 feet, which (as Mr. Archer assures me) I have erroneously stated (Fl. New Zeald. i. 116) to attain a lofty height, and to be the largest tree of the Natural Order in the Island. Trunk sometimes 3 feet in girth (*Gunn*); wood hard, white, close-grained, taking a good polish (*Cunningham*). *Leaves* 3–5 inches long, 2½–3½ broad, elliptic-lanceolate, acuminate, sharply toothed or quite entire; under surface, as well as the petioles, branches, and panicles, covered with an appressed silky tomentum. *Panicles* very much branched, effuse, large and spreading. *Heads* ⅓ inch long, obconical, about ten-flowered, white.

2. **Eurybia viscosa** (Cass. Dict. xxxvii. 487); ramis ramulis petiolis paniculisque glaberrimis junioribus viscidis, foliis lineari-lanceolatis obtusis integerrimis subtus argenteis costa discolore, paniculis polycephalis erectis, capitulis angustis paucifloris (3–6), involucri squamis paucis chartaceis acheniis elongatis glaberrimis pilosisve brevioribus, pappi setis uniseriatis inæqualibus.—*Nees, Ast.* 146; *DC. Prodr.* v. 266. Aster viscosus, *Lab. Nov. Holl.* ii. 53. *t.* 203. Balbisia Caledoniæ, *Spreng. Syst. Veg.* iii. 569, et B. suffruticosa, *Dietr.* (*fid. DC.*)

Hab. Abundant on the sides of mountains, especially in the southern parts of the Colony.—(Fl. Dec.) (*v. v.*) (Colonial name, "Dwarf Musk-tree.")

Distrib. New South Wales, *A. Cunn.*

A small bush, 4 feet high; the young shoots, leaves, and panicles very viscid. *Leaves* shortly petioled, lanceolate or linear-lanceolate, quite entire, blunt; upper surface, as well as the branches, petioles, and panicles, perfectly glabrous; under surface white, with a silvery, closely appressed tomentum. *Panicles* as long as the leaves, erect, spreading, many-headed. *Heads* narrow, few-flowered.—Some New South Wales states have much narrower leaves.

§ 2. *Shrubs with short, broad, very coriaceous leaves, one or more inches long, covered below with appressed tomentum. Heads panicled, rarely solitary.*

3. **Eurybia erubescens** (DC. Prodr. v. 267); ramis strictis robustis, ramulis foliis subtus paniculisque tomento appresso rufescente dense obtectis, foliis brevipetiolatis valde coriaceis ovatis oblongis lineari-oblongisve grosse inæqualiter subspinuloso-dentatis superne lucidis reticulatim venosis, paniculis foliis longioribus, capitulis sub-15-floris late obconicis, pappi setis exterioribus brevibus.—Aster erubescens, *Sieb. Pl. Exs.* 389. (*Gunn*, 690.)

Hab. Not unfrequent throughout the Colony: Hobarton, Middlesex Plains (3000 feet), Surrey Hills, Welcome River.—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and Victoria. (Cultivated in England.)

An erect, woody, robust shrub, with stout, strict, elongated branches, covered, as are the petioles, leaves beneath, and panicles, with an appressed, red-brown (rarely white), shining tomentum. *Leaves* extremely variable in size and form, from broadly-ovate to linear-oblong, ½–3 inches long, but usually oblong-ovate, and 1–1½ inch long, very rigid and coriaceous, coarsely, unequally toothed, almost spinulose, upper surface shining, reticulated. *Panicles* longer than the leaves. *Heads* broadly obconic, ½ inch long. *Pappus* reddish.

4. **Eurybia myrsinoides** (Nees, Ast. 146); ramis gracilibus, foliis subtus paniculisque tomento appresso argenteo obtectis, foliis obovato-oblongis oblongo-lanceolatisve obtusis acutisve coriaceis argute denticulatis, paniculis oligo-(1–3)-cephalis interdum foliis vix longioribus, capitulis angustis pauci-(4–6)-floris, pappi setis extimis paucis brevibus, acheniis glaberrimis.—*DC. Prodr.* v. 268. Aster myrsinoides, *Lab. Nov. Holl.* ii. 53. *t.* 202. (*Gunn*, 261.)

Hab. Hobarton, Chilton, Surrey Hills, 2000 feet, *Gunn.*—(Fl. Jan., Feb.) (*v. v.*)

Distrib. New South Wales and Victoria.

Rhizome creeping, sending up here and there a few slender stems, 2 feet high, sparingly branched. *Branches*, under side of leaves, petioles, and panicles covered with a silvery tomentum. *Leaves* always smaller than in *E. erubescens*, but equally variable in form, much less toothed. *Panicles* of few (one to three) heads, generally short, sometimes not longer than the leaves. *Heads* very narrow, few-flowered.

5. **Eurybia persoonioides** (DC. Prodr. v. 267); ramulis petiolis foliis subtus paniculisque tomento appresso albido v. rufescente dense obtectis, foliis obovatis elliptico-ovatis oblongo-lanceolatis lanceolatisve obtusis acutis acuminatisve integerrimis coriaceis, paniculis oligocephalis nutantibus, pedicellis filiformibus elongatis, capitulis late obconicis 6–12-floris, pappi setis uniseriatis subæqualibus, acheniis elongatis sericeis. (*Gunn*, 280, 1140, 1142.)

Hab. Alpine situations: Mount Wellington, Middlesex Plains, Lake St. Clair, etc., *Gunn.*—(Fl. Feb.) (*v. v.*)

A very beautiful plant, with pure white rays to the flowers, and dark green, shining foliage, usually dwarf, but sometimes reaching 2 or 3 feet in height; like its congeners its leaves are extremely variable in size and shape. *Branches*, petioles, under surface of leaves and panicles, covered with appressed, whitish, or dull, pale, red-brown tomentum. *Leaves* 1 or 2 inches long, broadly-obovate, oblong, oblong-lanceolate or lanceolate, blunt, acute or acuminate, margins always quite entire. *Panicles* axillary, few-flowered, drooping. *Heads* one to six, on very long filiform pedicels, broadly-obconical, with six to twelve flowers. *Achenia* silky, slender.

6. **Eurybia alpina** (Hook. fil. in Lond. Journ. Bot. vi. 106); fruticosa, ramis erectis petiolis foliis subtus paniculisque appresse brunneo-tomentosis, foliis elliptico-ovatis obtusis integerrimis, pedunculis axillaribus unifloris validis folio subæquilongis, involucri campanulati squamis plurimis imbricatis, acheniis glaberrimis. (*Gunn*, 280.) (Tab. XLII. *A.*)

Hab. Alpine regions, elev. 3–4000 feet: Mount Wellington and Western Mountains, *Fraser, Lawrence, Gunn.*—(Fl. Jan.) (*v. v.*)

A small shrub, very nearly allied to *E. persoonioides*, but quite different; easily recognized by the broad, elliptic-ovate leaves (which however are probably very variable in form, etc.), covered beneath, as are the petioles, branches, and panicles, with dense, brown, appressed tomentum, and by the solitary, stout, axillary peduncles, bearing a single broad capitulum, with many closely-imbricated involucral scales, and glabrous achenia.—Plate XLII. *A*. Fig. 1, floret of ray; 2, its stigmas; 3, hair of pappus; 4, floret of disc; 5, its stamen; 6, its stigmas: —*all magnified.*

7. **Eurybia obcordata** (Hook. fil. in Lond. Journ. Bot. vi. 108); ramulis brevibus petiolis foliis subtus paniculisque appresse subsericeo-tomentosis, foliis brevissime petiolatis cuneato-obcordatis apice obtuse 3–4-dentatis, pedunculis validis axillaribus solitariis monocephalis folio brevioribus, involucri obconici squamis tomentosis, acheniis glabratis pappo rufescente copioso. (*Gunn*, 424.) (Tab. XLII. *B.*)

Hab. Lofty mountains, 3–4000 feet: summit of Mount Wellington, Lake Arthur, Middlesex Plains, etc., *Lawrence, Gunn.*—(Fl. Dec.) (*v. v.*)

A small shrub, about 2 feet high, with a strong musky odour, very nearly allied to *E. alpina*, but at once

distinguished by the pale tomentum and obcordate-cuneate leaves, three- or four-toothed at the apex.—PLATE XLII. *B.* Fig. 1, floret of ray; 2, its stigmas; 3, floret of disc; 4, its stamen; 5, its stigma:—*all magnified.*

§ 3. *Large shrubs, with very tomentose branches, inflorescence, and under surface of leaves. Leaves usually more than an inch long, plane. Panicles large, many-flowered.*

8. **Eurybia lirata** (DC. Prodr. v. 267); fruticosa, ramis junioribus tomentosis adultis sulcatis, foliis alternis petiolatis lanceolatis integerrimis v. obscure serratis longe angustatis acuminatis basi obtusis supra glabris subtus tomentosis, corymbis axillaribus amplis polycephalis tomentosis, capitulis late campanulatis sub-30-floris, involucri squamis lineari-oblongis obtusis dense tomentosis, pappi setis interioribus subæqualibus exterioribus paucis brevissimis, acheniis ciliatis.—Aster liratus, *Sims, Bot. Mag. t.* 1509. Diplostephium liratum, *Nees, Ast.* 189. A. pulverulentus, *Hoffm. Verz. Pl.* 1824, 165 (*fid. DC.*). Olearia affinis, *Nob. in Lond. Journ. Bot.* vi. 109. (*Gunn,* 496.) (TAB. XLIII.)

HAB. Abundant throughout the Colony in wet places, on the skirts of woods, etc.—(Fl. Oct., Nov.) (*v. v.*) (Colonial name, "Daisy-tree.")

DISTRIB. South-eastern Australia, Victoria, *Mueller.* (Cultivated in England.)

A very handsome shrub, 10–15 feet high, erect, much branched, and loaded with flowers in spring. *Branches* glabrous, furrowed; *branchlets* tomentose with white down, as are the leaves beneath, the petioles, panicles, and involucres. *Leaves* 3–7 inches long, scattered, petioled, ½–1 inch broad, lanceolate, with rounded bases, tapering gradually to the point, glabrous, sometimes rugose or wrinkled above; nerves prominent, beneath divaricating; margins obscurely serrate or quite entire. *Corymbs* abundant, spreading; branches slender, much divided, divaricating. *Heads* white, ⅓ inch long and ½ broad. *Involucral scales* covered with dense tomentum, or sometimes more glabrous, green, with paler margins. *Rays* about fifteen. *Pappus* white or rufous.—The large, nearly entire leaves, distinguish this variety or species from *E. fulvida* and *E. Gunnii.*—PLATE XLIII. *A.* and *B.* Large and small-leaved states. Fig. 1, flower of ray; 2, stigmas; 3, hair of pappus; 4, floret of disc; 5, stamen; 6, stigmas:—*all magnified.*

9. **Eurybia fulvida** (Cass. Dict. xvi. 48); fruticosa, ramulis junioribus pubescentibus tomentosisve, adultis sulcatis, foliis sparsis breve petiolatis anguste lineari-lanceolatis grosse sinuato-dentatis acutis obtusisve superne scaberulis subtus petiolisque tomentosis nervis conspicuis, corymbis amplis polycephalis, pappi setis exterioribus paucis brevibus, acheniis pubescenti-pilosis.—Diplostephium stellulatum, *Nees, Ast.* 187. Aster stellulatus, *Lab. Nov. Holl.* ii. 50. *t.* 196. Olearia stellulata, *DC. Prodr.* v. 272.

HAB. Recherche Bay, Macquarrie Harbour, *Labillardière, Fraser, A. Cunningham, Gunn.*—(Fl. Dec.)

This species is exactly intermediate between *E. lirata* and *E. Gunniana*, and will, I suspect, prove that all these belong to but one species. However widely dissimilar many of the forms of these three are in habit and foliage and inflorescence, the flowers are the same in all. I have examined an authentic specimen of Labillardière's *Aster stellulatus*, and it is less well marked from *lirata* and *Gunniana* than what I have here described as the typical state of *E. fulvida*, the leaves being shorter, more oblong and less toothed, bringing it nearer *E. Gunniana*. The larger, deeply toothed leaves, which are scaberulous on the upper surface, are its best characters.

10. **Eurybia Gunniana** (DC. Prodr. v. 268); fruticosa, ramis canis, ramulis dense tomentosis, foliis alternis polymorphis oblongis lineari-oblongis anguste linearibusve integerrimis sinuato-dentatis lobulatisve obtusis acutisve coriaceis subtus dense fulvo-tomentosis nervis obscuris, corymbis paucifloris, pedunculis pedicellisque tomentosis, capitulis late campanulatis involucri squamis tomentosis glabratisve, radiis sub-15, pappi setis albis rufisve interioribus subæqualibus exterioribus paucis brevissimis, acheniis ciliatis.—*Nob. in Lond. Journ. Bot.* vi. 107. (TAB. XLIV.)

Var. *a. longipes;* pedicellis elongatis, capitulis mediocribus, foliis anguste lineari-oblongis obtusis

($\frac{1}{2}$–1 unc. longis, $\frac{1}{4}$–$\frac{1}{8}$ latis) supra puberulis glabratisve.—E. Gunniana, *DC. Prodr.* v. 268. (*Gunn*, 36, 180.) (*v. v.*)

Var. β. *brevipes;* pedicellis breviusculis, capitulis majoribus, foliis anguste lineari-oblongis subsinuato-dentatis obtusiusculis. (*Gunn*, 273, 1137, 1139.) (*v. v.*) (Tab. XLIV. *A.*)

Var. γ. *angustifolia;* pedicellis brevibus, capitulis ut in var. *a*, foliis linearibus. (*Gunn*, 1138.) (*v. v.*) (Tab. XLIV. *B.*)

Var. δ. *microcephala;* omnia ut in var. *a*, sed capitulis minoribus pedicellisque brevibus. (*Gunn*, 180.) (*v. v.*)

Var. ϵ. *cana;* dense cano-tomentosa, pedicellis brevibus, capitulis ut in var. *a*, foliis parvis ($\frac{1}{4}$–$\frac{1}{3}$ unc. longis) obovato-oblongis valde coriaceis utrinque v. subtus præcipue dense cano-tomentosis.—E. subrepanda, *DC. Prodr.* v. 268 (*fid. Herb. Lindley*). (*Gunn*, 273.) (Tab. XLIV. *C.*)

Var. ζ. *salicifolia;* pedicellis elongatis gracilibus, foliis elongato lineari-lanceolatis subintegerrimis (1–$2\frac{1}{2}$ unc. longis). (*Gunn*, 36 (of 1844), 1255.)

Var. η. *scaberula;* pedicellis capitulisque ut in var. *a*, foliis latioribus lineari-ellipticis argute serrato-dentatis supra scaberulis subtus dense fulvo-tomentosis. (*Gunn*, 1144.) (*v. v.*)

Var. θ. *phlogopappa;* pedicellis capitulisque ut in var. *a*, foliis latioribus oblongo-lanceolatis acutis grosse obtuse dentato-serratis repando-dentatisve.—E. quercifolia, *Cass. Dict.* xvi. 47. Olearia phlogopappa, *DC. Prodr.* v. 272. O. phlogotricha, *Spreng. Syst.* iii. 525. Aster phlogopappus, *Lab. Nov. Holl.* ii. 49. *t.* 195. *A.* (*Gunn*, 1144.) (*v. v.*)

Hab. Very common throughout the Island and at all elevations, ascending to 3000 feet: var. ζ on the northern side of the Colony; var. θ near the sea, chiefly on the southern coasts.—(Fl. Oct., Nov.)

Distrib. South-eastern Australia; Buffalo Range, Australian Alps, *Mueller*. (Cultivated in England.)

An authentic specimen of Labillardière's *Aster phlogopappa*, communicated from his Herbarium by the late Mr. Webb, proves it to be the same as De Candolle's *Eurybia Gunniana*, so named in Lindley's Herbarium by De Candolle himself; and it further agrees perfectly with specimens of *E. Gunniana* sent by Gunn from Labillardière's own locality at Recherche Bay. According to a rule of priority followed by some, the name *Eurybia quercifolia*, Cass., should be retained for this plant; but there is another plant, *Olearia quercifolia*, DC., which must be brought into *Eurybia*, and which better deserves that name, and the name *E. Gunniana* was applied by De Candolle to a much more common form of the species, which is now introduced into our gardens. The name of *Gunniana* is hence perhaps better retained, and all the more from its commemorating the name of the greatest explorer of Tasmanian Botany by one of the most beautiful shrubs of the Island, and one so common that every colonist must know it.

Eurybia Gunniana is one of the most variable shrubs in the Island, and the varieties I have indicated, though not constant, may suffice to indicate the more marked deviations from one common form. Some, no doubt, may belong to different parts of the same bush, but with plants so protean it is impossible to pronounce upon what belongs to the individual and what to its parts. As a species it is distinguished from *E. lirata* by the hoary, less grooved stems, much smaller leaves, with the nerves more obscure below; from *E. fulvida* also, which is exactly intermediate between *E. lirata* and *E. Gunniana*, by the smaller leaves.—A shrub, 3–5 feet high, erect, with erect, leafy, hoary or tomentose, obscurely-grooved stems, and very tomentose branches. *Leaves* abundant, $\frac{1}{4}$–$2\frac{1}{2}$ inches long, of all forms between linear-lanceolate or elongate-linear, and linear-oblong or obovate-oblong, obtuse or acute, glabrous above or rarely puberulous or scabrous, densely tomentose below, with obscure nerves; margins entire, crenate, repando-dentate or lobulate. *Panicles* few, two- to six-flowered, with long or short buds, generally slender, elongated peduncles and pedicels. *Heads* white, about $\frac{1}{2}$–$\frac{3}{4}$ inch across, thirty-flowered. *Involucral scales* linear-oblong, blunt, tomentose. *Rays* about fifteen. *Pappus* white or pale rufous, when dry; setæ nearly equal, except a few outer short ones. These are not more conspicuous in the variety θ, which is De Candolle's *Olearia phlogopappa*, than in the other varieties which he refers to *Eurybia*. *Achenia* ciliated with long hairs.—Plate

XLIV. *A*, *B*, and *C*, three forms of *E. Gunniana;* Fig. 1, floret of ray; 2, its stigmas; 3, floret of disc; 4, its stigmas; 5, stamen; 6, hairs of pappus:—*all magnified.*

§ 4. *Shrubs. Leaves very coriaceous, narrow-linear,* 1–1½ *inch long, with revolute margins. Heads in solitary, axillary, simple* (*or rarely branched*) *peduncles.*

11. **Eurybia pinifolia** (Hook. fil. in Lond. Journ. Bot. vi. 108); fruticulus humilis, ramis ramulisque validis lignosis, ultimis sericeo-tomentosis, foliis in ramulos abbreviatos fasciculatis rigide coriaceis linearibus pungentibus teretibus marginibus ad costam revolutis supra canaliculatis subtus junioribusque sericeis, senioribus superne glaberrimis, pedunculis solitariis axillaribus mono- rarius oligocephalis folio plerumque longioribus, capitulis majusculis multifloris, radiis 10–12. (*Gunn*, 828.) (Tab. XLV. *A.*)

Hab. Mount Wellington, elev. 3–4000 feet, and Vale of Belvoir, *Gunn.*—(Fl. Jan., Feb.)

A rigid, woody shrub, with very stout, erect, silky branches, densely leafy. *Leaves* erect or spreading, very hard, coriaceous and pungent, narrow-linear, 1–1½ inch long, terete from the margins being reflexed to the midrib, acuminate, silky beneath; young leaves silky on both surfaces. *Heads* on slender, silky peduncles, about as long as the leaves, axillary, solitary.—Plate XLV. *A.* Fig. 1 and 2, back and front view of leaves; 3, floret of ray; 4, arms of the style; 5, hair of pappus; 6, floret of disc; 7, stamen; 8 and 9, front and back view of leaves:—*all magnified.*

12. **Eurybia ledifolia** (A. Cunn. in DC. Prodr. v. 269); fruticulus humilis erectus robustus, ramis validis lignosis dense foliosis, ramulis petiolis pedunculis foliisque subtus dense tomentosis, foliis patenti-incurvis v. suberectis crasse coriaceis anguste linearibus obtusis marginibus ad costam revolutis nitidis superne medio canaliculatis, pedunculis validis folio paulo longioribus 1–2-cephalis, capitulis late turbinatis 10–12-floris, involucri squamis tomentosis, pappi setis subæquilongis, ligulis brevibus latis, acheniis glaberrimis. (*Gunn*, 284.)

Hab. Summit of Mount Wellington, *Fraser, Everett, Gunn*, etc.—(Fl. Jan.)

A small, woody species, with very much the habit of *E. pinifolia*, 6 inches to 1 foot high. *Branches* woody, erect, robust, leafy, tomentose. *Leaves* crowded, spreading or erect, narrow-linear, blunt, with margins recurved to the midrib, very coriaceous, shining above, tomentose beneath. *Heads* as long as the leaves, broad, solitary or in pairs, on a stout, tomentose peduncle of about the same length as themselves.

§ 5. Brachyglossa, DC.—*Leaves linear. Heads small, solitary, axillary, subsessile. Ligules very short.*

13. **Eurybia linearifolia** (DC. Prodr. v. 266); fruticosa, ramulis laxe cano-tomentosis, foliis anguste linearibus obtusis acutisve superne glabratis subtus dense tomentosis marginibus plus minusve revolutis, capitulis solitariis sessilibus vel breve pedunculatis axillaribus erectis folio brevioribus sub-10–15-floris, pappi setis albis subæquilongis, ligulis brevissimis, acheniis sericeo-villosis. (*Gunn*, 1974.)

Hab. On sand-hills near the sea-coast: Port Dalrymple, *Fraser*; Flinders' Island, *Gunn.*—(Fl. Feb., March.)

Distrib. South-east coast of Australia.

A hoary shrub, 3–6 feet high, with slender, erect branches, and leaves covered beneath with soft, white wool. *Leaves* ½–¾ inch long, shortly petioled, narrow-linear, blunt or subacute; margins recurved, quite entire: upper surface also woolly when young, glabrous when old. *Heads* about half the length of the leaves, rather narrow, shortly peduncled, about ten- to fifteen-flowered. *Ligulæ* very short indeed.—De Candolle describes the pappus as rufescent, but it is snow-white in all my specimens: it may however probably change with age and bad drying.

§ 6. *Leaves small (less than half an inch), narrow, tomentose below. Heads small, solitary, sessile, axillary or terminal. Ligules large.*

14. **Eurybia ramulosa** (DC. Prodr. v. 270); fruticosa, ramis ramulisque gracilibus virgatis pubescenti-tomentosis scabrisve setuloso-hirtis, foliis parvis alternis subfasciculatisve linearibus obtusis acutisve integerrimis superne scaberulis muricatisve marginibus revolutis subtus tomentosis, capitulis ad apices ramulorum brevissimorum secus ramos foliatos dense racemosis sub-20-floris, involucro flores subæquante, pappo uniseriato subæquali, acheniis sericeis.—*Nob. in Lond. Journ. Bot.* vi. 108.

Var. *α*; ramis pubescenti-tomentosis scaberulisve, foliis parvis linearibus, capitulis ramulis brevissimis secus ramos racemosis.—E. ramulosa, *DC. Prodr.* v. 270. Diplostephium ramulosum, *Nees, Ast.* 193. Aster ramulosus, *Lab. Nov. Holl.* ii. 50. *t.* 196. (*Gunn,* 1133, 1134.) (*v. v.*)

Var. *β. elongata;* ramis cano-puberulis, ramulis elongatis, foliis sparsis superne lævibus, capitulis majoribus floriferis. (*Gunn,* 1136.)

Var. *γ. floribunda;* ramis pubescentibus, ramulis brevibus, foliis patentibus superne opacis vix scaberulis, capitulis perplurimis.—E. Epileia, *DC. Prodr.* v. 270. (*Gunn,* 38.)

Var. *δ. densa;* ramis pubescentibus fastigiatis, foliis minimis. (*Gunn,* 827.)

Var. *ε. ericæfolia;* ramis pubescentibus, foliis densis subimbricatis.

Var. *ζ. laxa;* ramis pubescentibus pilosisque, foliis latioribus marginibus subrevolutis superne muricato-scaberulis. (*Gunn,* 1135 Cult.)

Var. *η. grandifolia;* ramis tomentosis, foliis majoribus lineari-obovatis obtusis. (*Gunn,* 1133.) (*v. v.*)

Var. *θ. aculeata;* ramis setuloso-hirtis, foliis superne muricato-scaberulis.—E. aculeata, *DC. Prodr.* v. 270. Aster aculeatus, *Lab. Nov. Holl.* ii. 52. *t.* 200. Aster exasperatus, *Link, En.* ii. 328. Diplostephium aculeatum, *Nees, Ast.* 192. (*Gunn,* 38.) (*v. v.*)

Hab. Common throughout the Island.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia and New South Wales.

A very common and variable plant. De Candolle distinguishes the *E. aculeata* by its having hairs on the branches (ramis setuloso-hirtis), and *E. ramulosa* by these being pubescent and scabrous (pubescenti-scabris); but if the two are different, the best character is the muricated or scabrous upper surface of the leaves of *E. aculeata*, which, though described as also being so in *E. ramulosa*, I do not find to be always the case. An original specimen of *E. aculeata*, from Labillardière's Herbarium, communicated by Webb, has the upper surface of the leaf quite glabrous and smooth, though described and figured by Labillardière himself as muricated.—A shrub, 3–6 feet high, with pubescent and sometimes setose or scabrid branches. *Leaves* very small, $\frac{1}{6}$–$\frac{1}{3}$ inch long, linear or linear-oblong, alternate or fascicled, scabrid above, with revolute margins, tomentose below. *Heads* very numerous, larger or smaller than the leaves, sessile on very short branchlets, which, being extremely numerous, give the inflorescence a racemose appearance.—The varieties enumerated are not distinct forms I fear, and some may very probably have been gathered from one individual.

15. **Eurybia lepidophylla** (DC. Prodr. v. 270); fruticosa, ramulis robustis dense lanato-tomentosis, foliis exiguis diametro ramulo brevioribus conferto-fasciculatis oblongis rotundatisve crassis marginibus revolutis integerrimis coriaceis subtus albo-tomentosis, capitulis ad apices ramulorum brevissimorum solitariis sessilibus sub-8-floris, pappi setis 1-seriatis subæqualibus v. 2-seriatis inæqualibus setis extimis brevibus.

Var. *α*; ramulis robustis, acheniis sericeis villosisve.—Aster microphyllus, *Lab. Nov. Holl.* ii. 51. *t.* 199; *DC. Prodr.* v. 270. A. lepidophyllus, *Pers. Encl.* ii. 442. (*Gunn,* 149.)

Var. *β. Lawrencii;* ramulis gracilioribus, acheniis glaberrimis. (An species distincta?) (*Gunn,* 826.)

Hab. Var. *α*. Sand-hills always near the sea, on the northern parts of the Island, *Lawrence, Gunn.* Var. *β*. Western Mountains, 3000 feet, and Middlesex Plains, *Lawrence, Gunn.*—(Fl. Jan., Feb.)

Distrib. South coast of Australia: Victoria and South Australia.

After many careful examinations, I am unable to find any character whereby to separate the alpine form of this plant from the maritime, except the glabrous achenium; and as I find that character to vary in amount very much in Australian specimens of var. α, I am inclined to attach the less importance to it. The branches are generally stouter in the maritime form, and Lawrence, who considers them the same, remarked that it had a glaucous hue, which the alpine had not.—A shrub, 3–6 feet high. *Branches* tomentose. *Leaves* the smallest in the genus, appearing like minute scales $\frac{1}{10}$ inch long, fascicled into little knots that are scattered along the branches, broad, rounded or oblong, coriaceous, with recurved margins and tomentose under surface. *Heads* sessile, terminal or lateral, small, ¼ inch long.—The form of the leaves distinguishes this from *E. floribunda*.

16. **Eurybia floribunda** (Hook. fil. in Lond. Journ. Bot. vi. 109); fruticosa, ramulis gracilibus divaricatis strictis flexuosisve foliisque subtus appresse subfurfuraceo-tomentosis, foliis parvis subfasciculatis brevissime petiolatis oblongis lineari-oblongisve obtusis superne glabris coriaceis marginibus revolutis, capitulis perplurimis parvis erectis secus ramulos subracemosis, involucri squamis glabratis dorso viridibus marginibus scariosis glandulosis ciliatis, pappi setis inæqualibus stigmatibus disci cono superatis, acheniis pubescentibus. (*Gunn*, 495.) (Tab. XLV. *B.*)

Hab. Common by the banks of rivers, especially on the Derwent, Formosa, Lake River, etc., *A. Cunningham, Gunn*, etc.—(Fl. Oct.) (*v. v.*)

Distrib. Mountains of Victoria, *Mueller.*

An extremely handsome species, covered with a profusion of blossoms, 4–6 feet high. *Branches* slender; branchlets spreading, covered with thick pubescence, as are the leaves beneath. *Leaves* very minute, $\frac{1}{8}$–$\frac{1}{6}$ inch long, fascicled, longer than the branchlets are broad, broad or linear-oblong, blunt, margins entire. *Heads* sessile, racemose, small, ¼ inch long, obconical, about eight- to twelve-flowered; ray flowers about six. *Involucral scales* scarious, with green centres and broad transparent margins.—The longer leaves, slender, divaricating branchlets and involucres, abundantly distinguish this from the *E. lepidophylla*, and the very much smaller leaves, glabrous achenia and different capitula and involucres, from *E. ramulosa*.—Plate XLV. *B.* Fig. 1 and 2, front and back view of leaves; 3, capitulum; 4, floret of ray; 5, arms of style; 6, hair of pappus; 7, floret of disc; 8, stamen; 9, arms of style:—*all magnified.*

§ 7. *Suffruticose or almost herbaceous. Leaves very narrow, linear, with revolute margins, not tomentose below. Heads in terminal corymbs, or solitary.*

17. **Eurybia glandulosa** (DC. Prodr. vi. 269); fructiculus glaberrimus, ramis ramulisque strictis erectis gracilibus, foliis alternis anguste linearibus marginibus revolutis glandulis prominulis notatis, pedicellis corymbosis elongatis gracilibus erecto-patentibus, capitulis parvis, involucri squamis linearibus marginibus membranaceis ciliatis, pappi setis inæqualibus, acheniis puberulis.—Aster glandulosus, *Lab. Nov. Holl.* ii. 50. *t.* 197. Galatella floribunda, *Nees, Ast.* 174. (*Gunn*, 37.)

Hab. Abundant on marshy river-banks, and throughout the Colony, ascending to 3500 feet.—Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia. (New South Wales, Victoria, and South Australia.)

A very slender plant, 2–4 feet high, glabrous everywhere. *Stems* terete, quite erect, as are the grooved or angled branches. *Leaves* spreading, $\frac{3}{4}$–$1\frac{1}{2}$ inch long, very narrow, linear, their recurved margins studded with tuberculate glands, that exude a viscid secretion, acuminate, glabrous. *Heads* very small, in terminal, spreading corymbs; pedicels slender, with minute, subulate bracteoles, ⅓ inch across. *Involucral* scales narrow, with membranous margins. *Flowers* of the ray white.

18. **Eurybia linifolia** (Hook. fil. in Lond. Journ. Bot. vi. 109); fruticulus humilis glaberrimus viscosus, ramis ramulisque robustis sulcatis angulatisque, foliis anguste linearibus acutis marginibus tenuiter

revolutis, capitulis subcorymbosis breviter pedicellatis majusculis sub-40-floris, pedicellis angulatis bracteolatis foliis brevioribus, involucri squamis chartaceis apice fuscis, pappi setis inæqualibus, acheniis angulatis glaberrimis glanduloso-puberulisve.—E. glutescens, *F. Muell. MSS.* (*Gunn*, 829.)

Hab. Sandy sea-coasts on the northern shores of the Island, Woolnorth, *Gunn.*—(Fl. Feb.)

Distrib. South-eastern Australia, Victoria, *Mueller;* and Bass' Straits, *Bynoe.*

A much stouter species than *E. glandulosa*, with broader leaves, more viscid, but without the prominent glands, and with less recurved margins; the heads also are larger, less corymbose, have shorter pedicels, and more involucral scales, which are rigid, hard, and glutinous, and with a dark, greenish-brown patch below the tip. *Pappus* white or reddish. *Achenia* obscurely glandular.

19. **Eurybia ericoides** (Steetz in Plant. Preiss. i. 423); fruticosa, erecta, glaberrima, viscosa, fastigiatim ramosa, ramis ramulisque gracilibus sulcatis, foliis brevibus erectis v. patenti-recurvis anguste linearibus obtusis marginibus integerrimis ad costam reflexis, capitulis terminalibus subsessilibus sub-20-floris, involucri squamis chartaceis viscosis medio fuscis, pappi setis subæqualibus rigidis, acheniis puberulis. (*Gunn*, 616.)

Hab. Great Swan Port, *Dr. Story;* Hobarton, *Backhouse, Dr. Lyall.*—(Fl. Oct.) (*v. v.*)

A very distinct species, apparently rare.—A small, slender shrub, 2 feet high, everywhere perfectly glabrous, more or less viscid and shining. *Stems* and branches erect, terete, grooved. *Leaves* $\frac{1}{5}$–$\frac{1}{3}$ inch long, usually patent and recurved, narrow-linear, blunt, with margins recurved to the midrib, and pressed flat to the under surface. *Heads* as in *E. linifolia*, but quite sessile at the ends of the branches. *Pappus* reddish, of very rigid setæ.

20. **Eurybia ciliata** (Benth. Plant. Hügel. p. 58); fruticulus, caulibus e radice plurimis erectis ascendentibusve, ramis ciliatis paucis erectis teretibus superne foliosis, foliis subimbricatis basi vaginantibus undique patenti-recurvis longe lineari-subulatis rigidis pungenti-acuminatis basi præcipue longe ciliatis marginibus ad costam arcte appressis, capitulis longissime pedicellatis, pedicellis nudis monocephalis superne pubescentibus, capitulis magnis sub-50-floris, involucri squamis anguste linearibus acuminatis, pappi setis subæqualibus rigidis, acheniis pilosis glabratisve.—*DC. Prodr.* vii. 273. (*Gunn*, 1972.)

Hab. South Esk River, *Gunn.*

Distrib. South-western and South-eastern Australia; from Australia Felix (*Mueller*), to King George's Sound.

This remarkable species is one of the very few Tasmanian *Compositæ* that inhabit South-eastern Australia; it differs widely from its previously described congeners in habit and characters.—*Roots* woody, giving off several ascending, sparingly-branched stems, a foot high. *Branches* erect, terete, ciliated. *Leaves* imbricating (seldom remote), with membranous, semiamplexicaul, expanded bases, $\frac{3}{4}$–$1\frac{1}{2}$ inch long, very rigid, linear-subulate, acuminate, pungent, with setose margins, reflexed to the midrib, and closely appressed to the under surface, smooth and shining. *Peduncles* very long, 3–6 inches, terminal, erect, stout, naked, terete, glabrous, pubescent above. *Heads* solitary, terminal, an inch across, flat and broad. *Involucral* scales narrow-linear, acuminate. *Pappus* white or reddish, very rigid.

Gen. II. CELMISIA, *Cass.*

Omnia *Eurybiæ*, sed *herbæ* acaules, scapigeræ, scapis monocephalis bracteatis.

After a careful examination of all the known species of this genus, of which there are twelve, chiefly natives of New Zealand, I am unable to find any characters, except those of habit, to separate it from *Eurybia;* instead of being branched shrubs, all are stemless herbs, with fibrous roots or short rhizomes, many spreading, radical leaves, that are almost invariably densely silky, erect, stout, bracteate scapes, with one large, terminal head. Only one (or perhaps two) Australian species is known. (Origin of name unknown to me.)

1. **Celmisia longifolia** (Cass. Dict. xxxvii. 259); foliis anguste lineari-elongatis superne appresse argenteo-araneosis nitidis subtus dense albo-lanatis marginibus revolutis, scapis multibracteatis involucrique squamis laxe lanatis, acheniis puberulis.—*Cass. Opusc.* ii. 20; *DC. Prodr.* v. 209; *Gaud. in Freye. Voy. Bot.* 470. *t.* 91. C. asteliæfolia, *Nob. in Fl. Ant. p.* 33 *in not.* (*Gunn*, 275.)

Hab. In bogs on the summits of the mountains, frequent at an elevation of 3–5000 feet; Mount Wellington, Arthur's Lakes, etc., *Fraser, Lawrence, Gunn.*—(Fl. Jan.) (*v. v.*)

Distrib. Alps of South-eastern Australia, *Mueller;* and New South Wales, *A. Cunningham.*

When I had only indifferent specimens of the Australian *C. longifolia*, Cass., I supposed that the *C. asteliafolia* was specifically distinct from it, but better specimens of the former, received from Dr. Mueller, prove that there is no difference at all between them.—A very beautiful plant, forming large silvery patches. *Leaves* erect or spreading, 3–10 inches long, $\frac{1}{4}$–$\frac{1}{2}$ inch broad, very coriaceous, blunt, acute or acuminate, shaggy with villous wool at their sheathing bases, with a shining, membranous cuticle, covered with a lax cottony web, and densely beneath with thick appressed woolly tomentum; margins revolute. *Scapes* a span long and upwards, stout, erect, woolly, with numerous linear bracts, $\frac{1}{2}$–$\frac{3}{4}$ inch long. *Heads* yellow or purplish in the centre, with long, white, revolute rays, tinged with pink, $1\frac{1}{2}$–2 inches broad. *Involucre* broad, scales narrow, linear, acuminate, the outer woolly. *Rays* linear, three-nerved. *Pappus* of one series of nearly equal, scabrid, white bristles. *Achenia* linear, angled.

Gen. III. VITTADINIA, *A. Rich.*

(Eurybiopsis, *DC.*)

Capitulum multiflorum, heterogamum. *Involucri* squamæ pauciseriatæ, anguste lineares. *Receptaculum* angustum, convexum, profunde alveolatum, nudum. *Fl. radii* fœminei, 1-seriales, anguste ligulati, *disci* hermaphroditi, tubulosi. *Pappus* sub-2-seriatus; setis scaberulis inæquilongis, exterioribus brevibus. *Achenium* lineare, compressum, sericeum.—Herbæ *v.* fruticuli *ramosi, hispido-pilosi;* ramis *herbaceis, ascendentibus, foliosis, in scapos* 1*-cephalos elongatis;* foliis *parvis, alternis.*

Though very unlike *Eurybia* and *Celmisia* in habit, there is little to distinguish this genus generically from them, the absolute character being confined to the compressed, very long achenia. In the New Zealand Flora I referred A. Richard's *V. australis* to *Eurybiopsis* of De Candolle, but upon examining its Australian congeners I find these are all referable to *Vittadinia*, whence De Candolle's genus *Eurybiopsis* should be suppressed. There are about four or five species known, which are Australian, except a peculiar species which inhabits New Zealand; all are probably extremely variable; they form hispid or pubescent herbs, with short, woody stems and ascending branches that terminate in single-headed peduncles.—*Leaves* small, alternate. *Involucral* scales few, narrow. *Ray-flowers* small, with inconspicuous, revolute ligulæ. *Pappus* very rigid, white or reddish; outer hairs shorter, very unequal in length. *Achenia*, when ripe, sometimes as long as the involucral scales, linear, compressed. (Name in honour of *Carlo Vittadini*, an Italian Botanist.)

1. **Vittadinia scabra** (DC. Prodr. v. 281); caule basi lignoso, ramis plurimis erectis foliosis scaberulis hispido-pilosisve, foliis linearibus lineari-spathulatisve erectis v. subrecurvis integerrimis v. obtuse 2–3-dentatis superne scabridis subtus marginibusque hispido-ciliatis, pedunculis brevibus, involucri squamis hispido-pilosis marginibus tenuiter scariosis, pappo pallide rufo, acheniis hispidis.—Eurybiopsis scabrida, *Nob. in Lond. Journ. Bot.* vi. 110. (*Gunn*, 696.)

Hab. Dry stony places; New Norfolk, *Lawrence, Gunn.*—(Fl. Nov., Dec.)

Distrib. Eastern Australia, from the tropic to Victoria.

A very rigid, much-branched herb, a span to a foot high. *Stem* woody below. *Branches* erect, leafy, scaberulous or hispid. *Leaves* erect or recurved, $\frac{1}{3}$–$\frac{1}{2}$ inch long, linear or linear-spathulate, quite entire or bluntly cre-

nate or lobed, hispid at the margins and below. *Heads* on short peduncles, less than ½ inch broad. *Pappus* of many unequal, scabrid, red hairs.

2. **Vittadinia cuneata** (DC. Prodr. v. 281); caule basi lignoso, ramis erectis elongatis gracilibus parce pubescenti-pilosis pilis appressis patentibusve, foliis anguste lineari-cuneatis interdum sublobatis integerrimisve apicibus sæpe recurvis, pedunculis gracilibus nudiusculis pubescentibus tomentosisve, capitulis subcorymbosis majusculis, pappo albo v. rufescente nitido.—Eurybiopsis gracilis, *Nob. in Lond. Journ. Bot.* vi. 110. (*Gunn*, 695.)

Hab. Common in many parts of the Island, in dry fields, bushy places, roadsides, etc., *Lawrence, Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. Extratropical Australia, New South Wales, Victoria, and Swan River.

A variable plant, of which *V. triloba*, DC., is a variety. This is one of the very few Australian *Compositæ* that ranges completely across the continent, from New South Wales to Swan River. It is readily distinguished from *V. scabra* by its greater size, more slender habit, generally appressed, much softer pubescence, more slender, pubescent or tomentose peduncles, much longer leaves (¾–1½ inch long), subcorymbose, larger heads, and shining, white or dull yellow-red pappus. *Rays* purplish. *Achenia* very compressed, pubescent, furrowed, often as long as the involucral scales.—A. Cunningham's original specimens have smaller leaves than any others which I have examined, and which are from six or seven very distant localities.

Gen. IV. ERIGERON, *L.*

Capitulum multiflorum, radiatum; *fl. radii* fœmineis, pluriseriatis v. pauciseriatis, ligulis angustis; *disci* tubulosis, omnibus v. pleris hermaphroditis. *Involucri* squamæ herbaceæ, lineares, pauciseriatæ. *Receptaculum* angustum. *Pappus* 1-seriatus, setis scabris, subæqualibus. *Achenium* compressum.—Herbæ; *species* Tasmanicæ *omnes alpigenæ, scaposæ;* radicibus *fibrosis;* foliis *omnibus radicalibus;* scapis *nudis bracteatisve, monocephalis;* fl. radii *pauciseriatis* (*roseis*); ligulis *angustis, marginibus involutis.*

After much examination and some vacillation, I have determined upon referring the little group of Tasmanian *Compositæ* which, in the 'London Journal of Botany,' I placed in *Aplopappus*, to *Erigeron*, to which Labillardière referred the first-described species, and to which Mueller has since doubtfully referred my *A. Gunnii*. A few of the species are also natives of the alps of South-eastern Australia; none have been found in New Zealand, but several inhabit Fuegia and Chili.

The genus *Erigeron*, as at present constituted, includes a vast number of chiefly north temperate herbs. The Tasmanian species are all alpine or subalpine herbs, with fibrous roots, and spathulate, radical leaves, and one-headed, erect scapes.—*Capitula* broad. *Involucral* scales of about two series, linear, acuminate, herbaceous. *Flowers* numerous; outer female, rayed, in two or more series, rays narrow, with involute margins; florets of the disc tubular. *Receptacle* narrow, alveolate. *Pappus* white or reddish, of one series, of nearly equal, rigid, scabrid hairs. *Achenia* compressed. (Name, the Greek one of this or a similar genus.)

1. **Erigeron Pappochroma** (Lab. Nov. Holl. ii. 47. t. 193); glaberrimum, foliis breviter petiolatis obovato-spathulatis obtusis coriaceis integerrimis v. obscure dentatis, scapo solitario rarius 2–3 gracili glaberrimo apice glanduloso-puberulo superne bracteolato, capitulis parvis, involucri squamis dorso puberulis.—*DC. Prodr.* v. 288. Aplopappus Pappochroma, *Nob. in Lond. Journ. Bot.* vi. 111. (*Gunn*, 1149.)

Hab. Summit of Mount Wellington, and Recherche Bay, *Labillardière, Gunn.*—(Fl. Jan.)

Gunn's specimens, gathered both on Mount Wellington and at Recherche Bay (in the locality visited by Labillardière), differ in no particular from those of the illustrious voyager himself, communicated by Mr. Webb to the Hookerian Herbarium. As a species this is intermediate between *E. Tasmanicum* and *E. Gunnii*, differing from the

former in its much smaller size, glabrous foliage, and slender scape; from *E. Gunnii* in the same characters, as also in the broader, more spathulate leaves.

2. **Erigeron Tasmanicum** (Hook. fil.); glaberrimum, foliis confertis patenti-recurvis longe petiolatis elliptico-spathulatis acutis coriaceis integerrimis subnitidis, scapo solitario gracili bracteato superne tantum puberulo, involucri squamis dorso scaberulis apices versus purpurascentes ciliatis, ligulis 2-seriatis, disco longioribus, acheniis glaberrimis.—Aplopappus Tasmanicus, *Nob. in Lond. Journ. Bot.* vi. 112. (*Gunn*, 1150.) (Tab. XLVI. *A.*)

Var. *β. stellata;* foliis lineari-lanceolatis oblongisve, acheniis puberulis.—Aplopappus stellatus, *Nob. in Lond. Journ. Bot.* vi. 112. (*Gunn*, 279.)

Hab. Mount Wellington; var. *β*, Hampshire Hills? *Gunn.*—(Fl. Feb., March.)

A very pretty species.—*Leaves* on long petioles, ½–1½ inch long, coriaceous, elliptical, gradually tapering into the petiole, quite glabrous, nerveless. *Scape* 1–4 inches long, slender, with few, small, linear bracteolæ. *Head* about ½ inch broad. *Rays* purplish-red. *Pappus* dirty white. *Achenia* quite glabrous.—Plate XLVI. *A.* Fig. 1. floret of the ray; 2, awns of the style; 3, floret of disc; 4, stamen; 5, stigmas; 6, hair of pappus:—*all magnified.*

3. **Erigeron Gunnii** (Muell. MSS.); totum glanduloso-puberulum v. pubescens, foliis coriaceis petiolatis obovato-spathulatis apice rotundatis obtuse dentatis integerrimisve, scapo subflexuoso superne pauci-bracteato, bracteolis lineari-spathulatis, involucri squamis glanduloso-pilosis, floribus radii 2–3-seriatis, pappo pallido, acheniis glaberrimis.—Aplopappus Gunnii, *Nob. in Lond. Journ. Bot.* vi. 111. (*Gunn.* 1151.) (Tab. XLVI. *B.*)

Var. *β. bellidioides;* foliis obovatis in petiolum latum angustatis, scapo brevissimo.—Aplopappus bellidioides, *Nob. in Lond. Journ. Bot.* vi. 112. (*Gunn*, 692.)

Hab. Mount Wellington, St. Patrick's River, Middlesex Plains, etc., *Gunn.*—(Fl. Nov.–Jan.)

Distrib. Alps of South-eastern Australia, *Mueller.*

This very much resembles *E. Tasmanicum*, but is covered everywhere with glandular pubescence, has much broader, often toothed leaves, with shorter petioles and stouter scapes, with fewer and longer bracteoles. Mueller sends a form of this species, with much stouter setæ on the leaves than the Tasmanian specimens, and considers it a variety of *E. Pappochroma*. It does not at all resemble that species in general appearance, but without a very full series of specimens of subalpine plants, from many localities, it is not possible to ascertain the limits of their variation.—A small species, about 2 inches across the foliage, covered everywhere with short, stiff, hispid hairs. *Leaves* flat, scarcely petioled, subspathulate or obovate, blunt, quite entire, or rarely with a few teeth. *Scape* very short. *Achenia* quite glabrous. *Pappus* white.—Plate XLVI. *B.* Fig. 1, floret of ray; 2, arms of the style; 3, floret of disc; 4, stamen; 5, arms of the style; 6, achenia; 7, hair of pappus:—*all magnified.*

Gen. VI. BRACHYCOME, *Cass.*

Capitulum multiflorum, heterogamum, radiatum; *fl. radii* 1-seriatis, ligulatis, femineis; *disci* tubulosis, 5-dentatis, hermaphroditis. *Involucri* late campanulati squamæ pauciseriatæ, herbaceæ, marginibus membranaceis. *Receptaculum* conicum, epaleaceum. *Achenium* plano-compressum, erostre, pappo brevissimo subsetiformi coronatum.—Herbæ *scaposæ v. caulescentes;* foliis *radicalibus, alternisve integris v. variè lobatis pinnatisectisve;* fl. disci *flavis,* radii *albis cæruleis roseisve.*

The species of this genus include the Daisies (not Daisy-trees) of Tasmania, some of them being extremely like their northern namesake, and one (*B. decipiens*) hardly distinguishable but by the short pappus. About thirty Australian species are known, chiefly natives of the south-eastern quarter of the continent. One New Zealand species is the only extra-Australian member of the genus.—Erect or decumbent herbs, with branching, alternately leafing stems, or radical leaves and scapes. *Capitula* broad, many-flowered, with a white or blue ray of female

flowers, and broader, yellow disc of tubular male ones. *Involucre* of two series of green scales, with membranous margins. *Receptacle* conical, pitted. *Achenia* compressed, epappose or crowned with a very short pappus. (Name from *βραχυς, short*, and *κομη, hair;* in allusion to the short pappus.)

§ 1. Scaposæ.—*Leaves all radical. Capitula on scapes.*

1. **Brachycome decipiens** (Hook. fil. in Lond. Journ. Bot. vi. 114); glaberrima, foliis omnibus radicalibus stellatim patentibus coriaceis oblongo- v. lanceolato-spathulatis obtusis subacutisve grosse obtuse crenato-serratis, scapis foliis subæquilongis nudis v. rarius 1–2-bracteolatis, involucri squamis linearibus obtusis margine atris, acheniis oblique obovatis non alatis pubescentibus. (*Gunn*, 511.) (Tab. XLVII.)

Hab. Abundant in grassy meadows, etc., throughout the Colony, *Lawrence*, *Gunn*.—(Fl. Aug.–Nov.) (*v. v.*)

Distrib. South-eastern Australia.

The remarkable similarity of this plant to the common English Daisy (*Bellis perennis*) is very curious, and has perhaps given rise to the impression that the latter plant is a native of Australia (see Schleiden, 'The Plant'). There are indeed specimens of *B. perennis* in our Herbarium from Gunn, but grown in gardens, where however it does not thrive.—Very variable in size. *Rhizome* very short, thick, sending out numerous stout, fleshy fibres. *Leaves* 1–4 inches long and $\frac{1}{4}$–1 broad, very coriaceous, lanceolate or oblong, spathulate, more or less toothed, narrowed into a broad petiole. *Scapes* one or more, erect, each bearing one head $\frac{1}{2}$–1 inch across. *Involucral scales* linear-oblong, blunt, with broad, black margins. *Ray* white. *Achenia* compressed, hairy, crowned with a few short, spreading, compressed, toothed scales.—Plate XLVII. Fig. 1, floret of ray; 2, scales of pappus; 3, arms of style; 4, floret of disc; 5, scale of its pappus; 6, stamen; 7, style:—*all magnified.*

2. **Brachycome tenuiscapa** (Hook. fil. in Lond. Journ. Bot. vi. 114); glabrata v. glaberrima, rhizomate brevi robusto, foliis coriaceis omnibus radicalibus confertis anguste subcuneato-spathulatis obtusis apices versus grosse paucidentatis trifidisve, scapo elongato gracili solitario unifloro nudo vel bracteolis 3–4 inferioribus subfoliaceis instructo, involucri squamis late linearibus obtusis, acheniis non alatis obovatis glaberrimis, pappo coronæformi minuto. (*Gunn*, 321.) (Tab. XLVIII. *B.*)

Hab. Arthur's Lakes and Middlesex Plains, *Gunn*.—(Fl. Jan., Feb.)

Distrib. Australian Alps, Victoria, *Mueller*.

A much more slender and graceful species than *B. decipiens*.—*Rhizome* stout. *Leaves* numerous, spreading, coriaceous, $\frac{1}{3}$–$1\frac{1}{2}$ inch long, obovate or cuneate-spathulate, coarsely toothed or lobed—chiefly towards the apex—very variable in length and breadth. *Scapes* slender, erect, much longer than the leaves, with several foliaceous bracts below the middle, rarely naked, pubescent or glandular towards the top. *Capitula* small, $\frac{1}{3}$–$\frac{2}{3}$ inch across. *Involucral scales* linear, blunt, not margined with black, or very obscurely so.—Plate XLVIII. *B.* Fig. 1, scale of involucre; 2, flower of ray; 3, arms of its style; 4, immature achenium; 5, flower of disc; 6, stamen; 7, arms of the style; 8, ripe achenium:—*all magnified.*

3. **Brachycome radicans** (Steetz in Plant. Preiss. i. 429); glaberrima, rhizomate elongato gracili repente ramoso, foliis omnibus (v. plerisque) radicalibus anguste lineari-elongatis integerrimis v. irregulariter pinnatifidis, scapis erectis ascendentibusve gracilibus 1–2-foliatis, involucri squamis lineari-oblongis obtusis, acheniis late alatis disco sulcatis alis rugosis.—L. pogonocarpa, *Muell. in Hort. Kew.* (*Gunn*, 397, 513.)

Hab. Marshy places, etc.: Marlborough, Arthur's Lakes, and South Esk River, *Gunn*.—(Fl. Dec., Jan.)

Distrib. South-eastern Australia, *Mueller*. (Cultivated in England.)

A slender, graceful species, everywhere quite glabrous.—*Rhizomes* long, slender, creeping, and rooting. *Leaves* all radical or a few on the scapes, 3–10 inches long, very narrow-linear, not $\frac{1}{8}$ inch broad, blunt, quite entire

or irregularly pinnatifid, with long, slender, patent lobes. *Scapes* very slender, long, erect, with one or more bracteal leaves below the middle. *Capitula* $\frac{1}{3}$–$\frac{2}{3}$ inch across. *Involucral scales* oblong, linear, blunt, not margined with black. *Achenia* with a broad, undulated wing on each side, its faces between the wings grooved.—Closely allied to *B. angustifolia*, but that is more caulescent, and has broader, acute leaves, with a very strong midrib.

4. **Brachycome linearifolia** (DC. Prodr. v. 306); glaberrima, rhizomate brevi crasso, foliis gramineis omnibus radicalibus angustissime lineari-elongatis erectis flexuosis integerrimis, scapis robustis erectis solitariis foliis longioribus 1–2-bracteatis, capitulis magnis, involucri squamis oblongis obtusis, acheniis obovatis puberulis non alatis. (*Gunn*, 158.)

Hab. Marshes: Mount Wellington, Formosa, Georgetown, etc., generally growing in water, *Gunn, etc.*—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia, ascending to 6000 feet, *Mueller*.

A very robust, large-flowered species, 6–18 inches high, perfectly glabrous.—*Rhizome* apparently short, rarely an inch long, very stout, covered at the apex with the withered remains of old leaves. *Leaves* grass-like, very numerous, long, narrow, erect, somewhat rigid and flexuose, 3–8 inches long, scarcely $\frac{1}{5}$ inch broad, grooved. *Scapes* solitary, robust, broader than the leaves, with one or two linear bracts. *Capitula* broad, flat, white. *Achenia* obovate, small, pubescent, not winged. *Pappus* very short, of few hairs.

5. **Brachycome scapiformis** (DC. Prodr. v. 306); glaberrima v. glabrata, rhizomate breviusculo, foliis omnibus (v. plerisque) radicalibus spathulatis v. obovato-spathulatis obtusis grosse crenatis coriaceis in petiolum angustatis, scapis solitariis elongatis gracilibus erectis basin versus bracteatis apices versus pubescentibus, capitulis magnis, involucri squamis linearibus acutis margine membranaceis, achenio obovato v. oblongo late v. anguste alato, alis integerrimis ciliatis serratisve.—B. leucanthemifolia, *Benth. En. Pl. Hügel.* 60. (*Gunn*, 168, 320.)

Variat insigniter statura, 4–20 unc., rhizomate apice simplici v. bi-tricipite, in caulem brevissimum divisum desinente v. abrupte foliato; foliis magis minusve coriaceis et crenatis, anguste v. late spathulatis, longe v. breve petiolatis; scapis infra medium multibracteatis v. nudis; capitulis $\frac{1}{3}$–1 unc. latis; acheniis latis angustisve, late v. anguste alatis, alis integris v. laceris ciliatis v. nudis.

Hab. Abundant in good soil, and also in marshy places throughout the Colony, *Lawrence, Gunn, etc.*—(Fl. Oct., Nov.) (*v. v.*)

Distrib. New South Wales and Victoria.

A very common and variable species, easily recognized by its size, spathulate, coarsely toothed or crenate radical leaves, long, erect, slender scapes, leafy below the middle and pubescent towards the apex, large capitula, with lilac or pale purple rays, and winged achenia, which are extremely variable in size and shape.

6. **Brachycome parvula** (Hook. fil.); glaberrima, rhizomate brevissimo v. nullo, foliis radicalibus anguste linearibus obtusis apices versus sensim dilatatis integerrimis coriaceis, scapis solitariis erectis v. e radice plurimis subcaulescentibus simplicibus basi decumbentibus foliosis superne longe nudis gracilibus, capitulis parvis purpureis, involucri squamis lineari-oblongis obtusis interioribus late obovato-spathulatis, acheniis junioribus anguste obcuneatis compressis, glaberrimis, pappo 0. (*Gunn*, 1971.)

Var. *α*; cæspitosa, foliis omnibus radicalibus $\frac{1}{2}$-pollicaribus, scapis solitariis nudis erectis.

Var. *β*; foliis radicalibus pollicaribus, scapis v. caulibus 4–5 basi decumbentibus foliosis demum longe nudis gracilibus erectis.

Hab. Flinders' Island, *Milligan*.—(Fl. Oct.)

A very small species, of which I have but few specimens, and these very dissimilar in habit, and belonging to two varieties. Whole plant very small, quite glabrous, with very narrow leaves, which are quite entire, rather co-

riaceous, and gradually slightly dilated from the base upwards. Variety *α* has very short stems or none, with radical leaves about ½ inch long, and solitary scapes with no bracts or one or two very small ones. Variety *β* has four or five scapes or stems from the root, each decumbent and leafy below, but terminating in slender, naked peduncles. *Capitula* purple, about ⅓ inch across. Young *achenia* obcuneate, glabrous, without pappus.—This may be a dwarf state of *B. graminea*, Mueller, of Victoria, but is a very much smaller plant, and the leaves are quite entire in all my specimens.

7. **Brachycome pumila** (Walp. Rep. ii. 584); acaulis, foliis omnibus radicalibus ovato-ellipticis in petiolum attenuatis grosse laciniato-serratis, serraturis 3–5 patentibus mucronulatis glanduloso-pilosis, capitulis in scapis foliis triplo longioribus terminalibus, acheniis non compressis clavatis scabridis pappo brevissimo coronatis.—*An* Lagenophora Billardieri? *vide Walp. Rep.* vi. 126.

Hab. Tasmania (*Herb. Berlin*).

I have no species answering to the above description. The species is apparently closely allied to *B. parvula*, but differs in the leaves being glandular-pilose, in the scabrid achenia, which are clavate and not compressed, and crowned with a short pappus.

§ 2. Caulescentes.—*Stems elongate, flexuose, terminating in naked, one-headed peduncles.*

8. **Brachycome angustifolia** (A. Cunn. MSS. in DC. Prodr. v. 306); glaberrima, caule gracili ascendente flexuoso, foliis paucis angustissime lineari-lanceolatis integerrimis acutis 1-nerviis nervo valido, pedunculo apice pubescente, involucri squamis oblongo-linearibus obtusis v. subacutis pubescentibus, acheniis non alatis obovatis puberulis, pappo 0? (*Gunn*, 266.)

Hab. Tasmania, *Gunn*.

Distrib. New South Wales, *A. Cunningham*.

Gunn's specimens of this species are not advanced enough to show the characters of the achenium, and which appears to be wingless, obovate, pubescent, and devoid of any pappus. De Candolle describes the pappus as very short, but I find none upon authentic specimens from Cunningham, gathered in Goulburn Plains. As a species it is readily distinguished by the flexuous, slender stem, with very long, quite entire, linear-lanceolate, acute leaves, furnished with a rigid, prominent midrib, and slender, erect peduncles, pubescent towards the apex. The stems, which are erect, are probably branches arising from a slender underground rhizome; the habit of the species is that of *B. radicans* and of *Paquerina graminea*.

9. **Brachycome stricta** (DC. Prodr. v. 305); pube brevi hirtella, caulibus decumbentibus erectisve strictis flexuosisve foliosis, foliis alternis lineari- v. oblongo-spathulatis in petiolum angustatis grosse dentatis trifidisve, pedunculis gracilibus involucrique squamis linearibus acutis pubescentibus, acheniis late alatis.—Bellis aculeata, *Lab. Nov. Holl.* ii. 55, 206. Brachycome aculeata, *Less. Synops.* 192, *excl. Syn.* (*fid. DC.*) *An* B. Sieberi? (*Gunn*, 66, 222, 388, 1146.)

Hab. Abundant in rocky places throughout the Colony, *Lawrence, Gunn, etc.*—(Fl. Nov., Dec.)

Distrib. South-eastern Australia (and South-western?).

This plant appears to agree entirely with Labillardière's plate and with De Candolle's description, but Labillardière states that his specimens are from Terra Van Leuwyn, which is in South-western Australia. It is very closely allied to *B. scapiformis*, but has decidedly leafy, branched stems, generally pubescent foliage, and often (always?) white rays. It also resembles *B. Sieberi*, DC., but has much larger capitula.—*Stems* 10–18 inches high, decumbent, and branched below, with ascending, leafy branches, which, as well as the leaves, are covered more or less with short pubescence. *Leaves* ½–2 inches long, linear, spathulate or gradually dilated from the petiole to the apex, more or less toothed or lobed, not coriaceous. *Peduncles* pubescent. *Capitula* extremely variable in size, ½–1½ inch across. *Involucral scales* linear, pubescent, acute. *Achenia* with broad, membranous wings.

10. **Brachycome oblongifolia** (Benth. in En. Plant. Hügel. 59); glaberrima, foliis elliptico-oblongis lanceolatis acuminatis basi angustatis integerrimis subtrifidisve, pedunculis 1-cephalis, involucri squamis acutiusculis pilis raris hispidis, acheniis subcompressis immarginatis lævibus ciliatis, pappo brevi stellato.—*DC. Prodr.* vii. 277.

Hab. Tasmania (*Bauer in Herb. Vienna*).

I have seen a very indifferent specimen of this in Mr. Bentham's Herbarium. It resembles *B. angustifolia* in habit and general appearance, but is more slender, and has much broader, shorter leaves.—Glabrous. *Stems* slender, branched. *Leaves* alternate, lanceolate or elliptic-oblong, acuminated, quite entire, the lower petiolate. *Peduncles* slender. *Heads* rather small. *Achenia* compressed, smooth, with two rows of cilia crowned with a pappus half their own length.

11. **Brachycome diversifolia** (Fisch. et Meyer, Cat. Hort. Petrop. 1835, p. 31); robusta, patentim pilosa v. glabrata, caulibus e radice plurimis ascendentibus foliosis robustis, foliis polymorphis petiolatis anguste obovato-spathulatis oblongisve crenatis lobatis pinnatisectisve, segmentis angustis integerrimis linearibus obovatisve, pedunculis validis apice nudis, capitulis magnis, involucri squamis oblongis obtusis marginibus late membranaceis, ligulis elongatis, acheniis anguste obovato-cuneatis non marginatis.—*DC. Prodr.* vii. 276. B. scapiformis, *β*, *DC. Prodr.* v. 306. Brachystephium leucanthemoides, *Less. Synops.* 388; *DC. Prodr.* vi. 304. Pyrethrum diversifolium, *Grah. Cat. Plant. Bar. Edinb.*: *Hook. Exot. Bot. t.* 215; *Lindl. Bot. Reg. t.* 1025. (*Gunn*, 830, 1145, 694.)

Hab. Common in grassy pastures throughout the Island, *Lawrence, Gunn, etc.*—(Fl. Sept.–Nov.)

Distrib. South-eastern Australia. (Cultivated in England.)

A very distinct species, readily known by its great size, robust habit, very broad heads, and long rays.—*Rhizome* very short, as thick as the thumb. *Stems* numerous, and ascending from the root, a span to 1½ foot long, as well as the leaves covered more or less with short, spreading hairs. *Leaves* extremely variable in size and lobing, etc., 1–3 inches long, petioled, rather membranous and flaccid, entire, lobed, crenate or pinnatifid, segments broad or narrow, quite entire or again lobed. *Heads* 1–2 inches broad.

12. **Brachycome ciliaris** (Less. Synops. 192); glaberrima v. sparse puberula, caulibus e radice plurimis ascendentibus ramosis rigidis gracilibus, foliis parvis profunde pinnatipartitis, laciniis anguste linearibus acutis divaricatis, pedunculis elongatis nudis apice involucrique squamis oblongo-linearibus obtusis late membranaceo-marginatis pubescentibus, acheniis obovatis compressis anguste alatis alis ciliatis.—*DC. Prodr.* v. 306. B. squalida, *Nal. in Lond. Journ. Bot.* vi. 115. B. multipartita, *Hook.* Bellis ciliaris, *Lab. Nov. Holl.* ii. 56. *t.* 207. (*Gunn*, 706.)

Hab. Chiefly in the central districts of the Island, as at Grindelwald, in Regent's Plains, Springhill, Campbelltown, etc., *Lawrence, Gunn.*—(Fl. Jan.)

Distrib. South-eastern Australia (Victoria and New South Wales).

A rigid, wiry species, 5–10 inches high, altogether glabrous or sparingly pubescent, with short, hispid hairs. *Root* woody, branched. *Branches* very numerous, spreading from the collum, slender, ascending, much divided. *Leaves* small, ½ inch long, oblong in circumscription, pinnatifid, the lobes narrow, linear, spreading, rather distant, rarely lobed or cut. *Peduncles* erect, pubescent below the capitulum, which is ½–¾ inch across. *Involucral scales* oblong, blunt, pubescent, with broad, membranous, lacerated margins. *Ray* purple. *Achenia* obovate-oblong, with narrow, ciliate wings.—Labillardière gives Terra Van Leuwyn, on the south-west coast of Australia, as the habitat of *B. ciliaris*, from whence however I have seen no specimens answering to the Tasmanian ones here described. De Candolle, on the other hand, mentions having examined specimens from the east coast of Australia. It is possible that the *B. iberidifolia* of South-west Australia, a species to which the present is very closely allied, may be Labillardière's *B. ciliaris*.

Note. I have seen no Tasmanian species exactly according with De Candolle's *B. Sieberi*, var. *Gunnii* (Prodr. v. 306), and suspect that the *B. stricta* may be the plant alluded to, which however is always much larger and stouter than *B. Sieberi*, and has winged achenia.

Gen. VII. PAQUERINA, *Cass.*

Omnia ut in *Brachycome*, sed receptaculo breviter paleaceo-fimbrillifero, et acheniis epapposis margine crassiusculis scrobiculis receptaculi insidentibus.—Herba *facie* Brachycome radicans *et* angustifolia *referens*; caule *gracili*; foliis *alternis, anguste linearibus, integerrimis*; scapo *monocephalo, gracili.*

1. **Paquerina graminea** (Cass. Dict. 37, p. 492).—*Less. Synops.* 192; *DC. Prodr.* v. 306. Bellis graminea, *Lab. Nov. Holl.* ii. 54. *t.* 204. *excl. fig. sinist.* (*Gunn*, 513, 834.)

Hab. Marshy places, not uncommon, *Labillardière*, etc.—(Fl. Oct.–Jan.) (*v. v.*)

The only species of the genus, and so very similar to the entire-leaved forms of *Brachycome radicans* and *B. angustifolia* as to be easily mistaken for that plant, but differing in the absence of pappus, in the achenia having very thick, corky margins, and in the fimbrillæ on the receptacle.—*Rhizome* slender, creeping, throwing up slender, erect branches. *Leaves* 1–5 inches long, very narrow, acute, gradually broader upwards, all radical, or alternate on the slender stem. *Peduncle* slender, erect, glabrous, pubescent below the capitulum. *Involucral scales* linear-oblong, subacute, puberulous, with broad, membranous margins. (Derivation of name unknown to me.)

Gen. VIII. LAGENOPHORA, *Forst.*

(Lagenophora *et* Ixauchenus, *Cass.*)

Omnia ut in *Brachycome*, sed acheniis obovato-oblongis compressis rostratis epapposis.—Herbæ *graciles, scapigeræ*; foliis *plerisque radicalibus.*

The species of this genus, of which about ten are known, are, with the exception of one, natives of the southern temperate zone; three are from New Zealand, one is a native of South Chili, five or six are Australian and Tasmanian, of which one (or possibly several allied ones) inhabits also Japan, China, and the East Indies. All are herbs, with slender, underground, creeping rhizomes, spreading, radical leaves, and slender, leafless, leafy, or bracteate scapes, terminated by a small capitulum. The structure of the capitulum and flowers almost entirely accords with *Brachycome*, but the achenia are obovate, and suddenly contracted to a glandular beak. (Name from λαγηνος, *a flagon*, and φερω, *to bear*; in allusion to the form of the achenia.)

1. **Lagenophora Billardieri** (Cass. Dict. xxv. 111); foliis utrinque pubescenti-tomentosis hirtellisve obovatis oblongis spathulatisve in petiolum angustatis sinuato-dentatis sinuato-pinnatifidisve, scapo gracili nudo v. 1–2-bracteato pubescente v. glabrato, involucri foliolis linearibus subacutis 2–3-seriatis appressis v. subpatulis, capitulis majusculis, acheniis late obovatis.—*DC. Prodr.* v. 307. Bellis stipitata, *Lab. Nov. Holl.* ii. 55. *t.* 105. Ixauchenus sublyratus, *Cass. Dict.* lvi. 176; *DC. Prodr.* v. 308. Brachycome pumila, *Walpers in Plant. Preiss.* ii. 584 (*fid. Steetz*). (*Gunn*, 67, 232.)

Variat insigniter statura, 3- ad 10-pollicari, hirsutie v. glabritie, caulibus brevissimis elongatis foliatisque simplicibus divisisve; foliis latis angustisve, longius v. brevius petiolatis, subintegris crenatis lobatis v. subpinnatifidis; scapo nudo v. 1–4-bracteato glabrato v. hirsuto; capituli magnitudine, squamisque involucri extimis paucis v. plurimis appressis v. patentibus.

Hab. Abundant throughout the Island, flowering all spring and summer. (*v. v.*)

Distrib. South-eastern Australia; apparently a small form of this also occurs in China, Japan, Ceylon, and the Khasia Mountains (in Eastern Bengal).

I am quite unable to define the varieties of this protean species, which sports from a little plant, 1 inch high, with radical, spreading leaves, and a solitary scape, to a branching, subcaulescent herb, whose several scapes, 8–10 inches long, arising from one root, bear alternate leaves for half their length. The leaves and scapes are pubescent, tomentose, or almost glabrous.—*Leaves* oblong or obovate-spathulate, 1–3 inches long, on long or short petioles, crenate, lobed or almost pinnatifid. *Involucral scales* in three series, the outer shorter, subulate, spreading. *Flowers* of the rays pale purplish, those of the disc yellow. *Achenia* broadly obovate, contracted to a cylindrical beak.—Sieber's No. 505, quoted by De Candolle as his *B. media*, and to which variety that author also refers the plant figured by Labillardière, appears to me to be a different species, with a smaller capitulum: it is perhaps Mueller's *L. pachyrhiza*, which is also a Swan River species, and perhaps *L. Hügelii*, Benth.

2. **Lagenophora latifolia** (Hook. fil. in Lond. Journ. Bot. vi. 113); hispido-pubescens, foliis late obovato-spathulatis in petiolum brevem angustatis obtuse sinuato-dentatis, scapis nudis, involucri squamis glabris, achenio lanceolato in rostrum sensim attenuato.—*An* L. Billardieri, *var.?* (*Gunn*, 1148.)

Hab. Mount Wellington, *Gunn*.—(Fl. Jan.)

Very nearly allied to *L. Billardieri*, and perhaps only a variety of that species, but the leaves are broader in proportion, and the achenia are much narrower, lanceolate, and gradually contracted into the beak.

3. **Lagenophora montana** (Hook. fil. in Lond. Journ. Bot. vi. 113); pusilla, glaberrima, foliis elliptico-lanceolatis acutis obtusisve in petiolum gracilem angustatis remote inæqualiter dentatis, scapo solitario gracili bracteolato, involucri squamis obtusis glabris, achenio obovato-lanceolato in rostrum breve angustato. (*Gunn*, 832, 833, 1148?) (Tab. XLIX. *A*.)

Hab. Circular Head, Woolnorth, and Lake St. Clair, in wet or marshy ground, *Gunn*.—(Fl. Jan., Feb.)

This again is very closely allied to *L. Billardieri*, and may prove a variety of it; but the numerous specimens belonging to three numbers in Gunn's collection accord very closely together, and differ from *L. Billardieri* in being very glabrous, in the usually smaller size, narrow, lanceolate, acute leaves, in the more blunt involucral scales, and in the narrower achenium, which is less suddenly contracted into the beak.—Plate XLIX. *A*. Fig. 1, capitulum; 2, flower of ray; 3, arms of its style; 4, flower of disc; 5, stamen; 6, arms of style; 7, ripe achenium:—*all magnified.*

4. **Lagenophora Gunniana** (Steetz in Plant. Preiss. i. 431); foliis utrinque tomentosis obovato- v. oblongo-lanceolatis obtusis breve petiolatis grosse sinuato-dentatis, scapis plurimis ascendentibus elongatis multibracteatis pubescenti-pilosis, involucri squamis subacutis, acheniis late obovatis in rostrum curvatum cylindricum abrupte angustatis. (*Gunn*, 510.) (Tab. XLIX. *B*.)

Hab. Pastures, etc., in Launceston, Penquite, Macquarrie Plains, etc., abundant, *Gunn*.—(Fl. Nov., Dec.)

Distrib. South-eastern and South-western Australia.

A larger species than any of the foregoing, with smaller capitula in proportion to the size of the plant, usually many leafy bracts on the numerous scapes, which are rarely naked, and broadly obovate achenia, suddenly contracted into a cylindrical beak, and with very short tubes to the flowers of the ray.—*Leaves* very tomentose on both surfaces, all radical, shortly petioled, obovate or oblong-lanceolate, often gradually dilated from the base upwards, rounded at the apex, coarsely sinuated and toothed. *Capitula* $\frac{1}{2}$–$\frac{3}{4}$ inch across: ray pale purple.—Plate XLIX. *B*. Fig. 1, flower of ray; 2, arms of the style; 3, flower of disc; 4, stamen; 5, arms of style; 6, ripe achenium:—*all magnified.*

5. **Lagenophora Emphysopus** (Hook. fil.); foliis omnibus radicalibus utrinque tomentosis anguste oblongo-lanceolatis obtusis obscure dentatis costa crassa, scapis pluribus brevibus robustis incrassa-

tisve patentim tomentosis, capitulis parvis, involucri squamis appressis subbiseriatis late lineari-oblongis obtusis margine membranaceis, fl. radii brevibus, acheniis lanceolatis utrinque angustatis.—Emphysopus Gunnii, *Nob. in Lond. Journ. Bot.* vi. 113. Solenogyne Gunnii, *Muell. MSS. in Herb. Hook.* (*Gunn*, 512.)

Hab. Common in pastures in various parts of the Colony, *Gunn, etc.*—(Fl. Dec.)

Distrib. Snowy plains on the Limestone River, Victoria, *Mueller.*

Very distinct from any of the previous species, and at one time, as I thought, worthy of being kept generically separate, but upon reconsideration I am induced to unite it with *Lagenophora;* Mueller places it in *Solenogyne*, from De Candolle's description of which genus however it differs in the presence of a ray; the habit is quite that of *Brachycome decipiens*, but the whole plant is densely pubescent or tomentose, and the capitula are very much smaller.—*Root* of many thick, fleshy fibres. *Leaves* numerous, spreading horizontally from the collum, 1–3 inches long, narrow-oblong or obovate-lanceolate, scarcely petiolate, blunt or rounded at the apex, obscurely toothed. *Scapes* numerous, scarcely so long as the leaves, densely pubescent with spreading hairs, very stout, and sometimes dilated in the middle or above it, and again contracted upwards. *Capitula* very small, $\frac{1}{3}$ inch across. *Involucre* broadly hemispherical, its scales in about two rows, broadly linear-oblong, blunt, with narrow, membranous margins. *Flowers* small, those of the ray with short, revolute ligulæ. *Achenia* elliptic-lanceolate, narrowed at both ends.

Tribe II. Senecionideæ.

Gen. IX. NABLONIUM, *Cass.*

Capitulum multiflorum, homogamum; *floribus* omnibus tubulosis 5-fidis, tubo breviusculo, lobis patentibus. *Involucrum* obconico-hemisphæricum; squamis late membranaceis, 3–4-seriatis, appressis, extimis ovatis acutis, intimis truncatis apice laciniatis. *Receptaculum* conicum, paleis magnis apice 3–5-cuspidatis onustum. *Styli* rami elongati, truncati, dorso marginibusque papillosi. *Achenium* obcompressum, coriaceum, late obovatum, in cornua 2 rigida spinescentia divergentia productum.—Herba *pusilla, scapigera;* rhizomate *gracili, repente;* foliis *ad nodos fasciculatis, erectis, petiolatis, lanceolatis, acutis, junioribus subtus albo-tomentosis glabrisve;* scapo *breviusculo, superne bracteolato,* 1-*cephalo;* capitulo *parvo;* floribus *flavis.*

1. **Nablonium calyceroides** (Cass. in Dict. Sc. Nat. xxxiv. 101).—*Less. Syn.* 259; *DC. Prodr.* vi. 37. (*Gunn*, 1979, 2046.) (Tab. XLVIII. *A.*)

Hab. Marshy ground, Flinders' Island, in Bass' Straits, and mouth of the Estuary, Macquarrie Harbour, *Gunn.*—(Fl. Dec.)

Distrib. South coast of Australia, *Bauer.*

A very remarkable little plant, the only one of its genus, very similar to a *Calotis*, and especially to the *C. scapigera*, Hook., but extremely different in the structure of the capitulum and flowers. De Candolle places it amongst *Anthemideæ*, with which division it has no natural affinity, besides differing from all his characters of that subtribe; on the other hand, it quite agrees with the characters of his division *Bidentideæ* of the Subtribe *Helianthea*, **in which it would appear to be naturally placed by habit also.**

A very small, insignificant, herbaceous plant, 1–3 inches high.—*Rhizome* slender, creeping underground, sending up very short branches, with tufts of leaves, and a solitary scape. *Leaves* about 1 inch long, erect or spreading, petiolate, lanceolate, acute, the young often covered below with hoary tomentum. *Scape* stout, erect, rather longer than the leaves, bracteate above, pubescent. *Capitulum* $\frac{3}{4}$ inch across. *Involucral* scales membranous, appressed, in several series; outer ovate, acute; inner narrower, lacerated. *Receptacle* conical, covered with large,

oblong, truncate paleæ, with laciniated, generally three to five cuspidate apices. *Flowers* yellow, sessile. *Achenia* compressed, coriaceous, obovate-cuneate, the margins produced into strong, divergent, pungent, rigid spines that are grooved down the inner face. *Corolla* tubular, five-cleft. *Anthers* with the lobes produced into slender tails. —PLATE XLVIII. *A*. Fig. 1, scale of involucre; 2, ditto of receptacle; 3, flower of ray; 4, arms of style; 5, vertical section of achenium; 6, embryo; 7, unexpanded flower of disc and involucral scale; 8, stamen;—*all magnified.*

Gen. X. COTULA, *L.*

(Cotula *et* Strongylosperma, *DC.*)

Capitulum multiflorum, discoideum, heterogamum. *Fl. radii* fœminei, 1–3-seriales, corolla 0 v. incompleta; disci masculi v. hermaphroditi, tubulosi, tubo plano v. obcompresso basi sæpe truncato v. cordato, apice 4-dentato. *Involucri* squamæ sub-2-seriatæ, lineares, margine membranaceæ. *Receptaculum* planum, nudum, papillosum. *Achenium* compressum, marginatum, epapposum; radii stipitatum, disci sæpius sessile.—Herbæ *carnosulæ v. teneræ;* foliis *alternis, integris v. sectis;* capitulis *flavis.*

The species of *Cotula* are far from being well investigated or defined; about six are known as natives of Australia, but the majority are South African; several are cosmopolitan. Usually insignificant, glabrous weeds, with rooting rhizomes, and herbaceous or delicate stems, terminating in elongated scapes that bear one discoid capitulum.—*Leaves* alternate, simple, entire, lobed or pinnatifid. *Involucral* scales in one or few rows, linear, blunt, herbaceous, with membranous margins. *Flowers* of the ray female, in one or more series, without corolla or with a very rudimentary one, their achenia compressed, stipitate. *Style* short. *Disc flowers* numerous, sessile, male or bisexual. *Corolla* tubular, compressed or terete, four-toothed, often truncate or cordate at the base. (Name from κοτυλη, *a cup;* in allusion to the form of the involucre.)

1. **Cotula coronopifolia** (Linn. Sp. Pl. 1257); glaberrima, caule crassiusculo radicante, ramis ascendentibus, foliis basi amplexicaulibus lineari-lanceolatis varie incisis lobatis pinnatifidisve, pedunculis gracilibus, fl. radii 2–3-seriatis numerosis longe stipitatis, achæniis late alatis ala apice bifida stylum fovente dorso glandulosis v. pilosis.—*DC. Prodr.* vi. 78; *Lam. Ill. t.* 700. *f.* 1; *Fl. N. Zeal.* i. 127. (*Green*, 382.)

HAB. Common in wet pastures by the sides of streams, etc., even in brackish water.—(Fl. Aug.–Dec.) (*v. v.*)

DISTRIB. South-eastern and South-western Australia, New Zealand, South Africa, Bonaria, Denmark, and North Germany, Spain. (Cultivated in England.)

Stems 2–10 inches long, creeping, branched. *Leaves* scattered, ½–2 inches long; petiole amplexicaul, often dilated into a broad lobed or toothed sheath; lamina lanceolate or oblong, variously toothed, lobed or cut or pinnatifid. *Capitula* ⅓–½ inch long. *Florets of the ray* with long pedicels, and broadly-winged achenia that are studded on the face, towards the axis, with glandular hairs. *Style* seated in a notch at the top of the achenium, there being no corolla.

2. **Cotula australis** (Hook. fil. Fl. N. Zeal. i. 128); gracilis, ramosa, pilis laxis subsericeis v. glabrata, foliis petiolatis oblongis pinnatifidis lobis linearibus subacutis integris v. pinnatifido-lobatis, pedunculis gracilibus elongatis, capitulis parvis, involucri squamis subbiseriatis membranaceis glaberrimis, fl. radii 3-seriatis stipitatis, disci paucis, achæniis radii obovatis late alatis ala crassiuscula apice emarginata v. in tubum (corollam) brevem producta.—Strongylosperma australis, *Less. Syn.* 261, *fid. DC. Prodr.* vi. 83. Ancyclus australis, *Sieb. Plant. Exsicc.* 331. *An* Cotula microcephala, *DC.*, *et* C. sororia, *DC.*? (*Drege, Coll. in Herb. Hook.*) (TAB. L. *A.*)

HAB. Moist banks near Hobarton.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern and South-western Australia, New South Wales, New Zealand, Tristan d'Acunha, (Cape of Good Hope?). (Cultivated in England.)

A very slender, much-branched plant, 2–8 inches high, more or less laxly tomentose or nearly glabrous. *Stems* and branches filiform. *Leaves* petiolate, pinnatifid or subbipinnatifid; the segments linear, spreading, rather remote, acute. *Peduncles* very slender. *Capitula* minute, $\frac{1}{6}$ inch across. *Florets of the ray* stipitate, in several series, broadly oblong, winged, notched at the top or with a rudimentary corolla round the base of the style, inner or both surfaces of the achenium glandular.—This has been referred to the genus *Pleiogyne* of Karl Koch (Bot. Zeit. i. 39, Jan. 1843) along with other allied species, characterized by having several rows of ray-flowers, and few disc ones; also by the disc flowers being more or less sterile, and their corolla not winged; but the numbers and proportion of these varies so much in the different species, that it appears to me to be undesirable to dismember the old genus *Cotula* on this account, and the disc flowers of all are more or less compressed, if not winged. De Candolle is in error in his characters of *Strongylosperma*, ascribing to it ligulate marginal flowers.—Plate L. *A*. Fig. 1, capitulum; 2, flowers of ray; 3, ditto, with ripe achenium; 4, flower of disc; 5, stamen; 6, apex of style:—*all highly magnified.*

3. **Cotula integrifolia** (Hook. fil.); pusilla, glaberrima, caule simplici filiformi parce foliato, foliis linearibus integerrimis, pedunculo solitario filiformi, capitulis minimis, fl. radii paucis 2–3-seriatis longe stipitatis, achenio late alato apice bifido, corolla 0. (*Gunn*, 1153.) (Tab. L. *B*.)

Hab. Moist ground near Georgetown, growing intermixed with *Desvauxiæ* and other plants, *Gunn*.—(Fl. Nov.)

A very minute, slender, inconspicuous plant, 1–2 inches high. *Stems* erect, weak, slender, unbranched or once or twice divided. *Leaves* linear, quite entire, very narrow. *Peduncles* very slender, solitary. *Capitula* very small. *Involucral* scales almost orbicular. *Flowers* very few.—Plate L. *B*. Fig. 1, capitulum; 2, involucral scale; 3, receptacle and stalks of ray-flowers; 4, flower of ray; 5, flower of disc; 6, corolla cup open, showing its thick walls; 7, stamen:—*all highly magnified.*

4. **Cotula alpina** (Hook. fil.); crassiuscula, glaberrima, caulibus prostratis ramosis foliosis, foliis breve petiolatis pinnatifidis segmentis subremotis lincaribus acutis integerrimis v. margine superiore 1–2-dentatis, pedunculis brevibus crassis, involucri squamis glandulosis, acheniis radii pluriseriatis breviter stipitatis oblongis late alatis alis superne ciliatis, corolla 0, receptaculo planiusculo.—Ctenosperma alpinum, *Nob. in Lond. Journ. Bot.* vi. 119. (Tab. LI. *A*.)

Hab. Subalpine and alpine situations in damp ground, Marlborough, etc., *Gunn*.—(Fl. Jan.)

Distrib. Victoria (Cobboras Mountain, elev. 5–6000 feet), *Mueller*. (Cultivated in England.)

A perfectly glabrous, procumbent, very herbaceous, stout little species.—*Root* of thick, fleshy fibres. *Stems* many, spreading, 1–3 inches long, branched leafy. *Leaves* $\frac{1}{4}$–$\frac{3}{4}$ inch long, petioled, pinnatifid. *Peduncles* short, very thick, axillary, shorter than the leaves. *Capitula* small. *Involucral* scales broad, herbaceous, in two series, glandular. *Flowers* of ray in several series, shortly stipitate, oblong, with ciliated wings, and no corolla. *Flowers* of the disc tubular, four-toothed, male, with a short, truncate style, not cleft at the summit.—I have suppressed the genus *Ctenosperma*, which I established upon this plant, a more extended examination of the species of *Cotula* having shown me that if the characters I had employed for separating it are considered of generic value, it will lead to the dismemberment of one very natural genus, and the construction of others with no good distinguishing characters.—Plate LI. *A*. Fig. 1, capitulum; 2, ditto, showing the receptacle; 3, flower of disc; 4, stamen; 5, style; 6, flower of ray; 7, vertical section of ripe achenium:—*all highly magnified.*

Gen. X. LEPTINELLA, *Cass.*

Capitulum multiflorum, homogamum v. heterogamum, discoideum. *Flores* sessiles v. breviter

stipitati; *radii* ♀, pluriseriati; corolla compressa, inflata, latiuscula, tubulosa, ore incrassato 3–4-crenato; stylo exserto, bifido, ramis divaricatis; *fl. disci* ☿, steriles, tubulosi, 4–5-dentati; staminibus 4–5; stylo exserto, stigmate disciformi subbilobo. *Involucri* squamæ 1–3-seriales, late ovatæ v. rotundatæ, marginibus scariosis sphacelatis. *Receptaculum* convexum v. conicum, nudum, papillosum. *Achenium* fl. radii obovatum, obcompressum, marginibus incrassatis; fl. ☿ nullum v. breve, stipitiforme.—Herbæ *facie* Cotulæ, *monoicæ* v. *dioicæ*.

This curious genus is confined to New Zealand, Tasmania, Southern Australia, Lord Auckland's and Campbell's Islands, Kerguelen's Land, and Fuegia, whence eight or ten species are known, of which three or four are Australian. The most peculiar character consists in the frequently inflated flowers of the ray, whose corolla is formed of two layers, with an intervening hollow space (see 'Flora Antarctica,' p. 28). As a genus it is perhaps hardly distinguishable from *Cotula*, in which the flowers of the circumference have sometimes an imperfect corolla, and only a very short stipes; the achenia are however usually more winged in the Australian species of *Cotula*. All the Tasmanian species have very few involucral scales, whence I proposed (Lond. Journ. Bot.) that they should be included in a subgenus, *Oligoleima*.—Creeping, monœcious or dicœcious herbs, often throwing out rooting suckers, smooth, silky, or woolly, with scapes bearing solitary, yellow, inconspicuous heads, which have no ray, and are button-shaped. *Leaves* pinnatifid. *Involucral scales* in one or many series, broad, with a membranous, brown or purplish edge. *Receptacle* convex or conical, naked, papillose. *Flowers* all sessile or shortly stipitate, those of the circumference numerous, in many series, female. *Corolla* short, compressed, inflated, tubular, with a contracted, small, truncate or four-toothed mouth. *Style* exserted, bifid. *Achenium* obovate, compressed, with thickened wings and no pappus. *Flowers* of the disc hermaphrodite, tubular, with a four-toothed corolla, and a style ending in a cup or disc. *Achenium* abortive. (Name, the diminutive of λεπτος, *slender*; in allusion to the habit of the species first discovered.)

1. **Leptinella longipes** (Hook. fil. in Lond. Journ. Bot. vi. 117); glaberrima, caule prostrato repente radicante, foliis erectis longe petiolatis lamina late ovata pinnatifida, laciniis paucis erecto-patentibus obovatis obtusis paucidentatis, pedunculis solitariis axillaribus elongatis foliis æquilongis erectis, capitulo sphærico, involucri hæmisphærici squamis rotundatis, floribus radii glandulosis, acheniis immaturis alatis maturis subtrigonis vix alatis. (*Gunn*, 404.) (Tab. LII. *A*.)

Hab. Marshes near Circular Head and Launceston, *Gunn*.—(Fl. Dec., Jan.)

Distrib. South-eastern Australia: Victoria, *Mueller*.

An insignificant, perfectly glabrous, creeping herb.—*Rhizome* rather stout, several inches long, sparingly branched, rooting at the nodes, and there bearing leaves and a solitary scape. *Leaves* erect, on petioles 1–3 inches long; lamina oblong, pinnatifidly cut into eight to ten obovate, lobed, cut or entire, spreading divisions. *Peduncles* erect, slender, about as long as the leaves. *Capitula* ⅓ inch broad. *Involucral scales* about five, in two series, orbicular. *Receptacle* conical, narrow. *Flowers* of circumference female, in several rows; their *achenia* obovate-oblong, shortly stipitate, obscurely winged when young, terminated by the very broadly conical, short, glandular corolla. *Style* exserted, decurved, bifid.—Plate LII. *A*. Fig. 1, capitulum: 2, vertical section of ditto; 3, scale of involucre; 4, floret of circumference; 5, achenia of ditto: 6, floret of disc; 7, anther; 8, style:—*all highly magnified*.

2. **Leptinella intricata** (Hook. fil. in Lond. Journ. Bot. vi. 117); pusilla, glaberrima v. pilosa, intricate cæspitosa, caulibus repentibus radicantibus validis foliosis ramosis apices versus præcipue pilosis, foliis breviter petiolatis basi in vaginam latam membranaceam dilatatis lamina ovato-oblonga pinnatifida, laciniis late ovatis profunde trifidis, segmentis acutis obtusisve, pedunculis brevibus, capitulis subsphæricis, involucri squamis orbiculatis herbaceis, floribus disci acheniisque compressis glandulosis. (*Gunn*, 405 *et* 1156.) (Tab. LII. *B*.)

Var. β. *multifida;* gracilior et hirsutior, segmentis folii petiolulatis late ovatis pinnatifidis.—L. multifida, *Nob. in Lond. Journ. Bot.* vi. 118.

Hab. Marshes, Georgetown, South Cape, etc., *Gunn.* Var. β, Kangaroo Point (Hobarton).—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia: Victoria, *Mueller.*

A much smaller species than *L. longipes*, with shorter peduncles, much more divided leaves, and more compressed, ovate, glandular achenia.—*Involucral scales* few, about four, rounded, glandular. *Corolla* of the flowers of the circumference very shortly urceolate, with a contracted mouth. *Style* shortly bifid.—Plate LII. *B.* Fig. 1, leaf; 2, capitulum; 3, vertical section of ditto, showing the receptacle; 4, flower of circumference; 5, transverse section of corolla of flower of circumference; 6, achenium; 7, floret of disc; 8, stamen; 9, base of corolla and style:—*all highly magnified.*

3. **Leptinella Filicula** (Hook. fil.); caule repente robusto radicante ramoso laxe villoso v. glabrato, foliis petiolatis oblongis pinnatifidis glabris laciniis patentibus lineari-oblongis paucidentatis, petiolo basi membranaceo vaginante, pedunculis brevibus villosis, involucri squamis pilosis, floribus radii multiseriatis compressis elliptico-oblongis alatis glandulosis corolla persistente conico truncato coronatis.—Symphyomera Filicula, *Nob. in Lond. Journ. Bot.* vi. 118. (*Gunn*, 258 *et* 693.) (Tab. LI. *B.*)

Hab. Hampshire Hills, Mount Wellington, and Christmas Rock, *Gunn.*—(Fl. Jan., Feb.) (*v. v.*)

Distrib. South-eastern Australia: Buffalo Ranges and Mount Wellington, Gipps' Land, elev. 5000 feet, *Mueller.*

I have suppressed the genus *Symphyomera*, which I proposed for this plant in the 'London Journal of Botany,' finding that it is connected with the other *Leptinellæ* through the New Zealand species of the genus.—A small, procumbent, rather fleshy herb. *Roots* of fleshy fibres. *Stems* spreading, branched, 1–4 inches long, leafy, stout, glabrous or villous, rooting at the nodes. *Leaves* 1–2 inches long, suberect or spreading, with long petioles, oblong, pinnatifid; segments linear-oblong, toothed, each lobe often infested by a black fungus. *Peduncles* very short, stout, villous. *Capitula* small. *Involucral* scales in about two series, oblong, blunt. *Flowers* of the circumference in many series, glandular, elliptical-oblong, compressed, attenuated upwards into an adnate, short, conical, truncate, obscurely three-lobed, persistent corolla. *Style* exserted, unequally two-lobed. *Achenium* compressed, obscurely winged. *Testa* fleshy. *Embryo* enclosed in a cellular albumen. *Flowers* of the disc tubular, four-toothed, with short stamens. *Style* discoid at the apex.—Plate LI. *B.* Fig. 1, leaf infested with a fungus; 2, capitulum; 3, achenium of ray; 4, the same cut open, showing the seed; 5, style; 6, seed, with the testa removed, showing the cellular albumen; 7, embryo; 8, flower of disc; 9, stamen; 10, style:—*all very highly magnified.*

Gen. XI. MYRIOGYNE, *Less.*

Capitulum multiflorum, heterogamum, discoideum. *Involucri* squamæ pauciseriatæ, disco breviores. *Flores* radii ♀, multiseriati; corolla tubulosa, perbrevi, ore subintegro; stylo exserto, bifido; *disci* ♀, pauci; corolla late campanulata, 4-fida; stylo apice discoideo v. bifido. *Receptaculum* convexum, papillosum, nudum v. pilosum. *Achenium* fl. ♀ lineari-clavatum, angulatum, epapposum, inferne pilosum, fl. ♀ stipitiforme.—Herba *parva, depressa, prostrata, repens, ramosa;* ramis *foliosis;* foliis *alternis;* capitulis *subsessilibus.*

1. **Myriogyne minuta** (Less. in Linnæa, vi. 219); glaberrima v. glabrata, caule repente, ramis decumbentibus prostratisve, foliis lineari-cuneatis spathulatisve apice grosse dentatis.—*DC. Prodr.* vi. 139; *Fl. N. Zeal.* i. 130. Cotula minuta, *Forst. Prodr.* 301. (*Gunn*, 560.)

Hab. Waste places, cultivated grounds, etc., *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. Throughout Australia, tropical and subtropical Asia and its Islands, Polynesia, New Zealand, Mauritius, and Madagascar.

A very common plant in many warm countries; sometimes, especially when it grows in dry places, possessed of pungent properties, causing sneezing when bruised under the nose.—A prostrate, creeping weed, quite glabrous, with sessile, axillary, rounded, inconspicuous, yellow heads, which are many-flowered, all but a few central flowers being female. *Stems* 4 inches to a foot long. *Leaves* $\frac{3}{4}$–$1\frac{1}{2}$ inch long, smooth, linear-cuneiform, coarsely toothed towards the point. *Heads* $\frac{1}{4}$ inch broad. *Involucre* of two series of linear, blunt, smooth or pubescent scales, shorter than the flowers. *Receptacle* convex, papillose, naked or with a few long hairs. *Female flowers* very numerous, densely packed. *Achenium* very long, club-shaped, hairy, ribbed or angled. *Corolla* very short indeed, tubular. *Style* bifid, exserted. *Hermaphrodite flowers* very few, in the centre of the capitulum, barren. *Corolla* broadly campanulate, four-cleft. *Stamens* four. *Anthers* very short. *Style* exserted, discoid and bifid. (Name from **μυριας, *a myriad*,** and **γυνη, *female*;** in allusion to the numerous female flowers.)

Gen. XII. SCLEROLEIMA, *Hook. fil.*

Capitula sub-4-flora; floribus omnibus tubulosis; masculo solitario.—Fl. Mas. *Corolla* infundibuli-formi-tubulosa, profunde 4-dentata, dentibus erectis acutis. *Stylus* validus, exsertus, apice globoso-capitatus, obscure bilobus. *Antheræ* latiusculæ, apicibus exsertis, vix cohærentes, basi breviter bi-auriculatæ. *Achenium* parvum, calvum, obscure tetragonum, lineari-obovatum.—Fl. Fœm. *Corolla* tubulosa, cylindracea, basi globosa, ore profunde 4-dentato, dentibus subæqualibus patentibus. *Stylus* elongatus, exsertus, apice breviter bifidus. *Achenium* obovatum, superne truncatum, tetragonum, angulis subacutis, carinatis, omnino calvum. *Involucrum* sub-4-phyllum, squamis 1-seriatis, chartacco-coriaceis, oblongis. *Receptaculum* nudum, angustum, planum.—Herba *pusilla* Tasmanica, *habitu* Forsteræ uliginosæ, *densissime cæspitosa, bryoidea*: caulibus *brevibus, compactis, fibras paucas crassas emittentibus*; ramis (*una cum foliis*) *crassis, angulatis*: foliis *arcte sub-4–6-fariam imbricatis, ovato-subulatis, basi late vaginantibus coriaceis, margine tenuissime cartilagineo*; capitulo *pedunculo brevissimo demum elongato subteuso*: floribus *minimis, valde inconspicuis*.

1. **Scleroleima Forsteroides** (Hook. fil. in Lond. Journ. Bot. v. 441. t. 14). (*Gunn*, 143.)

Hab. Summits of all the Tasmanian mountains, above 4000 feet elevation, forming green velvety cushions, *Lawrence, Gunn, etc.*—(Fl. Jan.) (*v. v.*)

A very singular little plant, forming a distinct genus, though one very closely allied to the *Ceratella*, Hook. fil., of Campbell's Island, *Trineuron*, Hook. fil., of Lord Auckland's Group (of which a species has been found in the Australian Alps by Mueller), and *Abrotanella*, Gaud., of Cape Horn and the Falkland Islands. All are genera belonging to a section or group of *Compositæ*, very near the *Hippieæ*, Less., but which may be readily distinguished by their perennial stems, their very peculiar habit, by the absence of pellucid glands, and by their being quite inodorous. The present is most nearly allied to *Abrotanella* of the three just alluded to, especially in the few involucral scales and florets, the densely packed stems, and imbricating, short leaves. It differs from the *Abrotanella emarginata* in the form of the female florets, and especially of the achenium. This is however the Tasmanian representative of that plant, occurring along with several other equally well marked representatives of the Antarctic American Flora, on the higher parts of the island only, where a vegetation is found in some degree analogous to what we should expect to find did Tasmania stretch far south into the Antarctic Ocean.—This little plant forms immense patches, sometimes extending for many feet, surrounded by *Pterygopappus*, *Perulfya*, *Coprosma*, *Restiaceæ*, and the *Oreobolus Pumilio*, Br. In general appearance it much resembles the *Forstera uliginosa* of Cape Horn, but is larger, and forms much broader patches.—*Stems* densely tufted, erect, sparingly branched, covered throughout their length with leaves; the *branches*, together with the leaves, angled from their mutual pressure: rooting by sending down long, thick, fleshy fibres. *Leaves* densely imbricating, subquadrifarious, suberect, short,

about $\frac{1}{3}$ inch long, broadly sheathing at the base, the rest subulate, acuminate, very thick and coriaceous, the margins obscurely cartilaginous and serrulate, bright green. *Capitulum* very small, when in flower hidden amongst the uppermost leaves, on a short, terminal peduncle, which elongates after flowering. *Involucral scales* erect, about four or five, forming together a subcampanulate cup, much shorter than the florets, or even than the achenia. *Flowers* about four, the three outer female, the inner larger, and male. *Perianth* of male flowers clavate, four-toothed, the teeth large, erect; of the female shorter, narrower, tubular, and also cleft, the teeth spreading. *Stamens* nearly free, half-exserted. *Styles* all exserted; of the male capitula two-lobed, of the female bifid. *Achenia* all larger than the involucral scales, short obovate, tetragonous, with the angles keeled, truncated at the broad apex, its coat coriaceous. *Seed* broadly ovoid. (Name from σκληρος, *hard*, and λειμα, *a scale;* in allusion to the coriaceous involucral scales.)

Gen. XIII. CALOCEPHALUS, *Br.*

Capitula 3-flora, homogama, in glomerulum globosum aphyllum dense congesta. *Glomeruli axis* seu *capitulorum receptaculum* ebracteatum. *Involucri* squamæ floribus sublongiores, scariosæ, obtusæ. *Corolla* tubulosa, 5-dentata. *Achenium* obovoideum. *Pappus* 1-serialis, setis paucis apice plumoso-pedicellatis.—Herbæ *erectæ, parce ramosæ, cano-tomentosæ;* foliis *oppositis, linearibus, integerrimis;* glomerulis *terminalibus, sphæricis.*

1. **Calocephalus lacteus** (Less. Synops. 271); foliis linearibus acutis obtusisve, glomerulis niveis oblongis globosisve.—*Ad. Brongn. Voy. Coq. Bot. t.* 60. *f. B.; DC. Prodr.* vi. 151. (*Gunn,* 394.)

Hab. Salt-marshes, growing with *Salicornia Indica;* Launceston, Circular Head, Glenelg River, and Portland Bay, *Gunn.*—(Fl. Dec., Jan.)

Distrib. South-eastern and South-western Australia.

Root perennial. *Stems* few, erect, very slender, 1–2 feet high, sparingly branched, white with appressed down, as are the leaves. *Leaves* in scattered pairs, opposite, linear, sharp or blunt, quite entire, 1 inch long. *Inflorescence* a spherical or oblong white head, composed of innumerable minute, sessile, few-flowered capitula. *Capitula* three-flowered, with no bracts or leaves surrounding or subtending them. *Involucral scales* few, scarious, blunt. *Flowers* hermaphrodite, all similar. *Corolla* tubular, five-toothed. *Achenia* obovoid, with a scanty pappus of slender hairs, which are plumose towards the apex. (Name from καλος, *beautiful*, and κεφαλη, *a head;* in allusion to the pretty snow-white glomeruli of the inflorescence.)

Gen. XIV. LEUCOPHYTA, *Br.*

Capitula 3-flora, homogama, in glomerulum globosum bracteis immixtum et foliolis 1-serialibus cinctum dense aggregata. *Glomeruli axis* seu *receptaculum* angustum, ebracteatum. *Involucri squamæ* sub-10, ovato-oblongæ, submembranaceæ. *Corolla* tubulosa, 5-dentata. *Antheræ* basi setiferæ. *Achenium* pedicellatum, obovoideum, glandulosum. *Pappi* setæ uniseriales, elongatæ, per totum longitudinem plumosæ.—Herbæ suffruticulosæ, *tomento appresso incanæ:* foliis *alternis, sessilibus, erectis, linearibus;* glomerulis *terminalibus;* rachi *conica.*

1. **Leucophyta Brownei** (Less. Synops. 271; DC. Prodr. vi. 152). (*Gunn,* 433.)

Hab. Seacoast: Georgetown, Port Dalrymple, Great Swan Port and elsewhere on the northern shores of the Island, *Gunn, Backhouse, etc.*—(Fl. Jan.)

Distrib. South-eastern Australia, from Port Lincoln to Wilson's Promontory.

This is a very variable plant in Tasmania, where however none of the specimens that I have seen equal in size those from South-western Australia, which hence seem to form a distinct variety. As a genus it appears too closely allied to *Leucophyta*, but differs materially in the alternate leaves, and in the glomeruli of the capitula being subtended by

short leaves, in the bracteæ scattered amongst the capitula, in the numerous involucral scales, in the pedicelled achenia, and in the longer, more copious, and plumose pappus.—Rather a rigid, much branched herb, 1–3 feet high, covered with densely appressed tomentum. *Branches* slender, divaricating or tortuous. *Leaves* small, alternate, appressed, linear, ¼ inch long, blunt, covered with silvery tomentum. *Glomeruli* terminal, spherical, variable in size, ¼–¾ inch diameter, snow-white. (Name from λευκος, *white*, and φυτον, *a plant*.)

Gen. XV. CRASPEDIA, *Forst.*

Capitula 5–8-flora, homogama, breviter stipitata, in glomerulum subrotundum bracteis sub quoque capitulo sitis cinctum aggregata; rachis cylindrica, lanata. *Receptaculum* angustum, margine paleis hyalinis onustum. *Involucri* squamæ hyalinæ, ellipticæ. *Corolla* tubulosa, 5-dentata. *Antheræ* basi setiferæ. *Stigmata* inclusa. *Achenium* oblongum, villosum. *Pappus* 1-serialis, setis filiformibus plumosis.—Herbæ *basi perennes;* caulibus *subsimplicibus, apice nudis,* 1-*cephalis, basi præcipue foliosis;* foliis *alternis, angustis, integerrimis;* glomerulis *globosis, flavis.*

A singular genus, generally easily recognized by its herbaceous, simple, erect stems, terminated by a soft ball of minute yellow flowers. About ten species are known, of which the *C. fimbriata*, Forst., a native of New Zealand, is the only extra-Australian one; the species are extremely difficult of discrimination, and I am not sure that all those I have described as Tasmanian are really distinct.—Herbaceous, stemless plants, with spreading radical leaves, and single, erect, long scapes, bearing a round, silky, bracteate ball, which consists of many capitula, crowded together, and attached by short pedicels to a central axis. *Capitula* of five to eight small, yellow, tubular, five-toothed flowers. *Involucre* of long, very membranous, transparent, hyaline, linear scales. *Receptacle* very narrow, bearing towards the margin slender hyaline scales, scattered amongst the flowers. *Pappus* of one row of very feathery hairs. *Anthers* terminated below with two tails. *Styles* included. *Achenia* hairy. (Name from κραστεδον, *a fringe;* in allusion to the hairy border of the leaf of many species.)

1. **Craspedia Richea** (Cass. Dict. Sc. Nat. xi. 353); parce pilosa, araneo-tomentosa v. glabrata, foliis radicalibus spathulatis oblongo-lanceolatis lineari-lanceolatis linearibusve, caulinis paucis linearibus, scapo gracili glabrato.—*DC. Prodr.* vi. 152. C. glauca *et* C. pilosa, *Spreng. Syst.* iii. 441 (*fid. DC. Prodr.*). C. glauca, *Lindl. Bot. Reg. t.* 1908. Podosperma pedunculare, *Reich. in Sieb. Herb. Exsicc.* 384. Richea glauca, *Lab. Voy.* i. 187. *t.* 16, *et Pl. Nov. Holl.* ii. 123. (*Gunn,* 117.)

Variat insigniter statura; foliis oblongo-lanceolatis anguste linearibusve, glaberrimis subtomentosi-ve; scapo plus minusve folioso, et diametro glomeruli.

Var. β. *linearis;* foliis anguste linearibus laxe araneo-tomentosis. (*Gunn,* 1160.)

Var. γ. *glabrata;* cæspitosa, parvula, glabrata v. glaberrima, foliis parvis linearibus. (*Gunn,* 1159.)

Var. δ. *gracilis;* tota laxe araneo-tomentosa, foliis anguste lineari-lanceolatis longe petiolatis, scapo gracili, involucri squamis purpureo-cinctis. Formis intermediis in *C. Richea* transire videtur.—*Sonder in Linnæa,* xxv. 493. C. gracilis, *Nob. in Lond. Journ. Bot.* vi. 118. (*Gunn,* 835.)

Hab. Abundant throughout the Island, ascending to 4000 feet.—Var. β. Western Mountains. Var. γ. Marlborough, *Gunn.* Var. δ. Middlesex Plains, *Gunn.*—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. South-eastern and South-western Australia (New Zealand?). (Cultivated in England.)

A very common and variable plant, of which Mueller has sent a fine suite of extremely dissimilar forms from Victoria. One of these so entirely resembles the New Zealand *C. fimbriata*, Forst., that I cannot but suspect that all may prove connected by intermediate forms with that most variable species. The var. γ is a peculiar dwarf form, with small, glabrous, linear leaves; it appears to grow in tufts in alpine situations. The smaller size and slender habit best distinguish this species from the following.

2. **Craspedia macrocephala** (Hook. Bot. Mag. t. 3415); elata, robusta, glabrata v. glaberrima,

foliis radicalibus obovato-lanceolatis pilosis glaberrimisve, caulinis sessilibus basi sæpius dilatatis.—A *C. Richea* non differt nisi caule elatiore et capitulis 8–13-floris.—*Sonder in Linnæa,* xxv. 493. (*Gunn,* 507.)

Var. *α*; foliis angustioribus.

Var. *β*; scapo folioso, foliis latioribus superioribus sessilibus basi subauriculatis.

Hab. Common in wet pastures, etc.; in ponds of water at Georgetown, *Lawrence, Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia.

I can detect no characters whereby to distinguish this species but the very much greater size, and the ciliated and auricled bases of the cauline leaves of some states.—It grows 3 feet high, is very stout, with leaves 4–8 inches long, broad and strongly nerved, or narrow, pilose or quite glabrous. *Glomerules* of capitula 1–2 inches in diameter. —I suspect that a good series of specimens would unite this with *C. Richea.*

3. **Craspedia alpina** (Back. MSS. in Lond. Journ. Bot. vi. 119); tota tomento niveo laxe v. appresso dense obtecta, caule erecto robusto, foliis radicalibus lineari-lanceolatis utrinque niveis, involucri squamis late ovatis medio lanatis marginibus late membranaceis. (*Gunn,* 835.)

Hab. Abundant upon Mount Wellington and all other mountains, *Lawrence,* etc.—(Fl. Feb.) (*v. v.*)

Distrib. Mount Buller, Victoria, elev. 5000 feet, *Mueller.*

A very handsome species, easily distinguished by the clear white tomentum on every part of the Tasmanian specimens, but which is rare or absent on the upper surface of the leaves of the Victoria specimens. Size and habit of *C. Richea,* but more robust, with larger glomeruli of capitula.

Gen. XVI. SKIRRHOPHORUS, *DC.*

Capitula uni-bi-flora, homogama, in glomerulum capituliforme involucro generali cinctum dense aggregata. *Involucri generalis* folia biseriata, imbricata, linearia, acuminata, inæqualia, exteriora foliacea, interiora scariosa. *Involucrum capituli* 4–5-phyllum; squamis oblongis, scariosis, hyalinis. *Corolla* tubulosa, 4–5-dentata. *Stamina* 4–5; filamentis brevibus; antheris connatis, breviter basi biaristatis. *Styli* rami subelongati, truncati. *Achenia* obovoidea, papillosa, truncata, calva.—Herbæ *pusillæ, annuæ v. suffruticulosæ;* foliis *parvis, oppositis alternisque, linearibus;* glomerulis *extus lanatis, rarius glabris.*

1. **Skirrhophorus eriocephalus** (Hook. fil. MSS., Gray in Journ. Bot. iii. 148); foliis paucis acuminatis, involucri generalis foliis lineari-subulatis acuminatis, capitulis paucioribus.—S. Fuernrohrii, *Mueller, MSS.* (*Gunn,* 1973.) (Tab. LIII. *A.*)

Hab. Amongst *Salicornia* and other herbage close to high-water mark, near Georgetown, *Gunn.*—(Fl. Nov.)

Distrib. South-eastern Australia: Brighton, *Mueller;* Melbourne, *Adamson.*

A very singular little plant, 1–2 inches high, much resembling a large Moss in habit, the brown, erect, filiform stems growing close together, like the fruit-stalks of *Polytricha,* and the glomeruli resembling the capsules. I had originally referred this plant to *Skirrhophorus,* in which Asa Gray agrees, as Mueller has since, though the original species of that genus is suffrutescent, with a totally different habit. Asa Gray (Journ. Bot. iii. 148, 1851), in a review of the *Anyiantheæ,* refers this and the closely allied *S. Preissianus* to the same genus. Placing it in a separate section, he enumerates six species of the genus, all but the present natives of South-western Australia. The glomeruli of this plant are surrounded with coriaceous, linear, not hyaline bracts; the corolla is four-toothed, and the teeth short and not reflexed; there is no thickening at the base of the corolla, and the leaves are generally opposite.—*Stems* solitary or numerous from the root, glabrous. *Leaves* few, linear-subulate, acuminate, radical, spreading, ¼ inch long. *Glomeruli* ¼ inch long, obovate-oblong, surrounded by woolly, linear, bracteal leaves. *Capitula* densely crowded on a nearly plane papillose receptacle, very minute, two-flowered. *Involucral scales* four to six,

oblong or spathulate, hyaline. *Corolla* tubular, four-toothed. *Achenium* obovoid, truncate, without pappus. (Name from σκιρρος, *a tumor*, and φερω, *to bear;* in allusion to the base of the corolla of some species being thickened.)—PLATE LIII. *A*. Fig. 1, leaf; 2, glomerule; 3, receptacle on which the capitula are placed; 4, capitulum; 5, flower and scale of involucre; 6, corolla cut open; 7, stamen; 8, style; 9, achenium cut open; 10, embryo:—*all very highly magnified.*

Gen. XVII. PUMILO, *Schldl.*

Capitulum solitarium, 3–6-florum, homogamum. *Involucri squamæ* sub-2-seriales, inæquales, hyalinæ, tenerrimæ, medio herbaceæ. *Receptaculum* angustissimum, epaleaceum, papillosum. *Corolla* parva, brevis, tubulosa, 4-dentata. *Antheræ* breviter bisetosæ. *Styli* rami mediocri, truncati. *Pappus* constans e squamis 8, magnis, radiantibus, chartaceis, obovatis, acuminatis, albidis. *Achenium* obconicum, curvatum, glandulosum, areola laterali latissima.—Herba *annua, minima, araneo-pilosa v. glaberrima;* caule *tenuissimo, subsimplici;* foliis *oppositis.*

1. **Pumilo Preissii** (Sonder in Linnæa, xxv. 487); foliis linearibus, capitulis foliis paucis bracteatis, pappi squamis sub-8 obovatis acuminatis.—Actinopappus perpusillus, *Hook. fil. in Lond. Journ. Bot.* 1852, *p.* 226. Styloncerus multiflorus, *N. ab E. in Pl. Preiss.* ii. 244. (*Gunn*, 2009.) (TAB. LIII. *B.*)

HAB. Westhead, Tamar River, Georgetown, growing on bare trap rocks, *Gunn.*—(Fl. Oct.)

DISTRIB. South-eastern and South-western Australia.

The other species of this singular little genus are natives of South-western Australia.—The present species is almost microscopic, consisting of excessively slender, thread-like, simple or branched, annual stems, ½–1½ inch long, bearing a very few pairs of opposite, linear, subulate leaves, and one (rarely more) capitulum, which consists of a few unequal involucral scales surrounding three to six flowers, which are conspicuous for their oblique achenia, each crowned with a spreading, white, star-like pappus, formed of about eight obovate, acuminate, white, scarious scales. *Corolla* broadly tubular, four-cleft. *Stamens* four. *Anther-lobes* with tails. *Achenium* glandular, with a lateral, broad areola, where the pappus is inserted. (Name from ακτιν, *a ray*, and παππος; in allusion to the star-shaped pappus.)—PLATE LIII. *B*. Fig. 1, involucral scale; 2, flower; 3, another with the pappus erect; 4, another with the pappus spreading; 5, corolla laid open; 6, stamen; 7, style; 8, achenium cut longitudinally; 9 and 10, embryo:—*all very highly magnified.*

Gen. XVIII. APALOCHLAMYS, *Cass.*

Capitulum homogamum, 10–16-florum; floribus tubulosis, 5-dentatis, hermaphroditis. *Involucrum* oblongum, squamis scarioso-diaphanis, conniventibus. *Receptaculum* angustum, paleolatum. *Antheræ* basi ecaudatæ. *Achenium* obovatum, breve. *Pappus* deciduus, 1-serialis; setis filiformibus, æqualiter tenuiter barbellatis.—Herbæ; caulibus *erectis, tomentosis;* foliis *decurrentibus, lanceolatis, acuminatis;* panicula *decomposita.*

1. **Apalochlamys Billardieri** (DC. Prodr. vi. 157); paniculæ ramis erectis, capitulis secus ramos sessilibus pedicellatisve, bracteis involucrique squamis obtusis acutisve.—A. Endlicheri *et* A. Kerrii, *DC. l. c.?* Cassinia spectabilis, *Ker. Bot. Reg. t.* 678. (*Gunn*, 743.)

HAB. Port Dalrymple, Woolnorth, and Islands of Bass' Straits, *Gunn.*—(Fl. Feb., March.) ("Tobacco" of Sealers.)

DISTRIB. South-eastern Australia: Wilson's Promontory, *Mueller.* (Cultivated in England.)

I am acquainted with only one species of this genus, and I suspect that De Candolle's *A. Endlicheri* and *A. Kerrii* are both referable to it. Brown indeed (fid. DC.) refers the Tasmanian species to *Cassinia spectabilis* (*A. Kerrii*, DC.), and De Candolle says of *A. Endlicheri* that the flowers are perhaps in a monstrous state.—A tall,

robust, much branched herb, 2–5 feet high, with a strong, peculiar, sweetish smell. *Stem* robust, tomentose, branching above into a very large, erect, ovate, decompound panicle, a foot long. *Leaves* alternate, sessile, half-amplexicaul, spathulate-lanceolate or oblong-spathulate, acuminate, tomentose below, 3–5 inches long. *Branches* of panicle leafy, white with tomentum, slender, ascending. *Capitula* sessile or pedicelled, turbinate, ¼ inch long, of many equal, hermaphrodite, tubular, five-toothed flowers. *Involucral scales* linear-oblong, blunt or acute, scarious, hyaline, transparent, in two or three series. *Receptacle* narrow, with long, filiform paleæ. *Pappus* of slender, equal, scabrid, soft hairs. *Styles* with occasionally three equal arms, each truncate. *Achenium* small, oblong. (Name from **απαλος**, *tender*, and **χλαμυς**, *an integument;* in allusion to the membranous involucre.)

Gen. XIX. CASSINIA, *Br.*

Capitulum pauci-(9–12)-florum; floribus omnibus hermaphroditis, tubulosis, v. paucissimis ambitu fœmineis, angustis. *Receptaculum* angustum, paleaceum; paleis distinctis, linearibus, floribus immixtis, apicibus interdum radiantibus albidis. *Involucri squamæ* multiseriatæ, scariosæ, exteriores imbricatæ, breves, interiores sæpissime elongatæ, apicibus albidis. *Stigmata* obtusa, hispidula. *Antheræ* inclusæ, basi bisetæ. *Achenium* obovatum, erostre. *Pappus* 1–2-serialis; setis plurimis filiformibus, apice incrassatis aut penicillatis.—Fruticuli *v.* arbusculi; foliis *sparsis, sæpius linearibus, marginibus revolutis;* corymbis *terminalibus, interdum paniculatis.*

A rather extensive genus, a few species of which are found in New Zealand and New Caledonia, but the majority belong to Australia, where about a dozen are known, chiefly natives of the east side of the Continent. It so closely resembles *Ozothamnus* that it requires close observation to distinguish the species.—Branching shrubs, with small, evergreen or rusty-coloured, harsh leaves, and terminal panicles or corymbs of many white or pink capitula. *Heads* small, nine- to twelve-flowered. *Flowers* all tubular, hermaphrodite, or with a few slender female ones at the circumference. *Receptacle* very small, with narrow, linear, white-tipped scales, like the inner ones of the involucre, scattered amongst the flowers. *Scales* of the involucre numerous, scarious, generally pubescent; outer imbricated; inner with white, radiating tips. *Anthers* with two bristles at the base. *Achenium* obovate, blunt. *Pappus* of one or two series of slender, soft hairs, which are pilose or thickened at the tips. (Named in honour of *M. Henri Cassini*, an eminent French botanist.)

1. **Cassinia aculeata** (Br. in Linn. Trans. xii. 126); frutex erectus, ramulis cano-pubescentibus, foliis patulis 1–2-pollicaribus anguste linearibus margine plerumque ad costam revolutis supra muriculatis v. hispidulis, corymbis decompositis congestis, capitulis turbinatis 5–7-floris, involucri squamis albidis v. rufescentibus non radiantibus pappi setis sub lente scaberulis apice subincrassatis.—*DC. Prodr.* vi. 156. Calea aculeata, *Lab. Nov. Holl.* ii. 41. 185. (*Gunn*, 39.)

Hab. Abundant throughout the Colony.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. South-eastern Australia, from New South Wales to Melbourne.

A handsome shrub, 3–5 feet high, covered in summer with a profusion of corymbs of white capitula.—*Stems* and *branches* and under side of leaves covered with hoary pubescence or tomentum. *Leaves* 1–2 inches long, spreading, linear; margins revolute generally to the midrib, upper surface hispid or minutely aculeate. *Inner scales of the involucre* erect, not radiating.

Gen. XX. OZOTHAMNUS, *Br.*

Omnia *Cassiniæ*, sed receptaculum epaleaceum, et involucri squamis interioribus plerisque radiantibus.

This genus so closely resembles *Cassinia* that several species have inadvertently been put into one instead of the other. So far as the Tasmanian species are concerned, they may always be known from *Cassinia aculeata* by the absence of paleæ on the involucre; nevertheless *O. rosmarinifolius* so closely resembles that plant that they may

very readily be confounded. About thirty species of *Ozothamnus* are known, of which three inhabit New Zealand, and all the rest are Australian; almost all are confined to the south-east parts and Tasmania. The sections into which I have divided the Tasmanian species are by no means natural, but are the most definite I have been able to construct. (Name from οζω, *to scent*, and θαμνος, *a bush*; from the smell of some of the resinous species.)

§ 1. *Capitula sessile, collected into terminal heads. Leaves small.*

1. **Ozothamnus Hookeri** (Sonder in Linnæa, xxv. 509); fruticulus robustus, ramosissimus, ramulis virgatis albo-tomentosis, foliis minimis triangulari-ovatis subtrigonis imbricatis, ramulis arcte appressis dorso medio linea alba marginibus (fere ad costam) reflexis glutinosis, capitulis parvis ad apices ramulorum sessilibus capitatim congestis sub-6-floris, involucri squamis interioribus albis radiantibus.—O. lepidophyllus, *Nob. in Lond. Journ. Bot.* vi. 120; *non Steetz in Plant. Preiss.* Baccharis? lepidophylla, *DC. Prodr.* v. 427. (*Gunn*, 123.) (Tab. LV. *B.*)

Hab. Abundant on the mountains throughout the Colony, at elevations of 3–5000 feet, *Lawrence, etc.* —(Fl. Jan.) (*v. v.*)

Distrib. South-eastern Australia: Cobboras Mountain, elev. 6000 feet, *Mueller.*

A small, woody shrub, 1–5 feet high (rarely 8 feet), much branched, easily recognized by the tomentose branches, very minute, triangular-ovate, often glutinous, appressed leaves, and terminal, sessile heads of small capitula, with white, radiating tips to the involucral scales.—Plate LV. *B.* Fig. 1 and 2, leaves; 3, capitulum; 4, flower; 5, stamen; 6, arms of style:—*all magnified.*

2. **Ozothamnus lycopodioides** (Hook. fil. in Lond. Bot. vi. 119); fruticulus virgatus, glaberrimus, viscosus, ramis tuberculatis, foliis lineari-oblongis obtusis laxe imbricatis erectis enerviis margine minutissime cartilagineo-serrulatis, capitulis multifloris ad apices v. in axillis ramulorum congestis sessilibus, floribus extimis fœmineis, involucri squamis non radiantibus apicibus fuscis chartaceis viscosis basi extus araneosis, acheniis papillosis pilosisque, pappo clavellato. (*Gunn*, 1976.) (Tab. LVII. *A.*)

Hab. Sugar-loaf, Great Swan Port, *Backhouse;* Apsley River, near the same locality, *G. L. Burnett, Gunn.*

A very remarkable species, perfectly glabrous, a foot or so high, with erect, slender, twiggy, tubercled branches, the upper covered with imbricating, oblong, blunt, very coriaceous, viscous leaves, ¼ inch long.—*Capitula* ten to twelve, forming terminal heads, rarely axillary in the branches. *Involucral* scales fuscous at the tips or purplish, not radiating nor white, slightly woolly on the back and viscid; outer flowers female. *Pappus* thickened upwards. *Achenia* papillose and hairy.—Plate LVII. *A.* Fig. 1, leaf; 2, capitulum; 3, flower of circumference; 4. pappus; 5, flower of disc; 6, stamen; 7, arms of style:—*all magnified.*

3. **Ozothamnus selaginoides** (Sonder and Mueller in Linnæa, xxv. 511); fruticulus ramosus, glaberrimus, ramis decumbentibus tuberculatis, ramulis erectis foliosis, foliis minimis lineari-oblongis patenti-recurvis obtusis marginibus recurvis costa subtus prominula, capitulis parvis ad apices ramulorum aggregatis sessilibus sub-8-floris, involucri squamis exterioribus subpubescentibus chartaceis, interioribus paucis apicibus albis breviter radiantibus, achenio pubescente. (*Gunn*, 1975.) (Tab. LVI. *B.*)

Hab. Table Mountain, west of Oatland, elev. 3000 feet, *Stuart, Gunn.*—(Fl. Nov.)

A most distinct little species, as indeed are all of this section. A small, perfectly glabrous undershrub, 6 inches to a foot high, with much-branched, tubercled stem.—*Branchlets* leafy. *Leaves* small, ⅛ inch long, patent and recurved, sessile or with a short adnate petiole, coriaceous, linear-oblong, blunt. *Capitula* small, six to twelve together, sessile at the ends of the branchlets, ten- to twelve-flowered, with small, white, radiating points to the inner involucral scales. *Achenia* pubescent.—Plate LVI. *B.* Fig. 1, leaf; 2, capitulum; 3, flower; 4, pappus; 5, stamen; 6, arms of style:—*all magnified.*

4. **Ozothamnus scutellifolius** (Hook. fil.); ramulis strictis divaricatis gracilibus lana fusca dense obtectis, foliis minimis orbiculatis reflexis (ramulo angustioribus) marginibus ambitu recurvis supra glabris convexis subtus dense tomentosis, capitulis parvis ad apices ramulorum congestis sessilibus sub-15-floris, involucri squamis hyalinis pallidis nitidis apice non albis nec radiantibus, floribus exterioribus 4-dentatis fœmineis, achenio piloso. (*Gunn*, 1977.) (Tab. LVI. *A*.)

Hab. Port Arthur, *G. L. Burnett*.—(Fl. Dec.)

This again is a very singular species, and quite unlike any other. I have seen only one small specimen.—*Branches* slender, divaricating, densely covered with fulvous tomentum. *Leaves* very curious, minute, $\frac{1}{16}$ inch broad, forming small, green, recurved scales, appressed to the branchlets, orbicular, coriaceous, convex above, the margin recurved all round, tomentose beneath. *Capitula* six to eight, sessile, aggregated at the tips of the branchlets. *Involucral* scales scarious, hyaline, not white or radiating at the tips. *Flowers* about fifteen, those of the circumference four-toothed and female.—Plate LVI. *A*. Fig. 1 and 2, leaves; 3, tip of branch and capitula; 4, flower of circumference; 5, arms of style; 6, flower of disc; 7, stamen:—*all highly magnified.*

§ 2. *Capitula pedicelled, corymbose. Involucral scales not white nor radiating at the tips.* (*In* O. reticulatus *the inner involucral scales have very short, radiating, white tips.*)

5. **Ozothamnus obcordatus** (DC. Prodr. vi. 165); fruticulus erectus, ramis ramulisque teretibus tomentosis glabratisve, foliis patentibus petiolulatis obcordatis basi cuneatis supra glabris nitidis subtus tomentosis albidis, corymbis polycephalis ramosis ramis patentibus, involucri oblongi squamis aureis scariosis nitidis obtusis apicibus non radiantibus, capitulis 4–8-floris, floribus exterioribus fœmineis, acheniis oblongis pubescentibus. (*Gunn*, 1168.) (Tab. LV. *A*.)

Hab. Dry hill-sides near the Derwent, at Risdon, *Gunn*.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia: Victoria.

A small bush, 2–4 feet high, branching from the base, with erect, terete, twiggy branches. *Leaves* $\frac{1}{6}$–$\frac{1}{4}$ inch long, obcordate, glabrous above, white with appressed tomentum beneath, on very short petioles, spreading, and somewhat recurved; margins not recurved, minutely erose. *Corymbs* golden-yellow, shining, much-branched, branches tomentose, spreading. *Capitula* small, bright yellow, shining. *Involucres* oblong, with imbricating, blunt, scarious scales, about four- to eight-flowered.—Plate LV. *A*. Fig. 1 and 2, leaves; 3, capitulum; 4, flower of circumference; 5, pappus; 6, flower of disc; 7, stamen; 8, arms of style:—*all magnified.*

6. **Ozothamnus reticulatus** (DC. Prodr. vi. 164); fruticulus robustus, ramulis crassis dense araneo-lanatis, foliis patulis crasse coriaceis linearibus v. late linearibus sessilibus obtusis supra glabris nitidis reticulato-venosis lævibusve subtus dense tomentosis marginibus recurvis, corymbo ramoso denso polycephalo, capitulis late turbinatis multifloris, involucri squamis brevibus dense tomentosis apicibus glabris concoloribus non radiantibus, receptaculo alveolato fimbrillifero, floribus exterioribus fœmineis, acheniis dense sericeis.—Chrysocoma reticulata, *Lab. Nov. Holl.* ii. 40. *t.* 183. Faustula reticulata, *Cass. Dict. Sc. Nat.* 16, 251. Helichrysum reticulatum, *Spreng. Syst. Veg.* iii. 471. (*Gunn*, 166, 697.)

Hab. Rocky shores of the Colony: South Cape, Cape Raoul, Tasman's Peninsula, Great Swan Port, *Backhouse, Gunn, etc.*

Distrib. South coast of Australia (*fid. DC.*).

A very handsome species, distinguished from all its Australian congeners by the densely silky achenium, the hairs on which are sometimes bifid.—A shrub about 4–5 feet high, with very stout, woody branches, the branchlets, corymb, and under surface of leaf densely covered with thick, white wool, that often flakes off. *Leaves* spreading, very thick and coriaceous, linear, $\frac{1}{2}$–2 inches long, blunt, upper surface shining, with the lateral nerves impressed, margins recurved. *Corymb* dense. *Capitula* large, broad. *Involucre* woolly, many-flowered, the scales glabrous

at the tips, inner erect, acuminate. *Flowers* very numerous.—I have from Gunn (n. 1167) a plant very closely resembling this, but with leaves only ¼–½ inch long; it is in too young a state for determination, and was gathered at St. Paul's River (Avoca).

7. **Ozothamnus cinereus** (Br. in Linn. Trans. xii. 125); fruticulus robustus, cano-tomentosus, foliis brevissime petiolulatis confertis patentibus anguste linearibus rigidis obtusis supra subaraneosis glabratisve opacis (non lucidis) marginibus revolutis subtus dense tomentosis, corymbis densis polycephalis, capitulis multifloris, involucris elongato-turbinatis squamis exterioribus acutis interioribus apice brevissime radiantibus albidis, floribus exterioribus fœmineis, acheniis puberulis.—*DC. Prodr.* vi. 164. O. turbinatus, *DC. Prodr.* vi. 164. **Chrysocoma cinerea, *Lab. Nov. Holl.* ii. 39. *t.* 182.** (*Gunn*, 431.)

Hab. Northern shores of the Colony: Woolnorth, sand hills near Georgetown, etc., *Labillardière, Gunn.*—(Fl. Jan.)

Distrib. South-eastern Australia: Victoria and New South Wales.

Labillardière's original specimens differ from Gunn's only in the rather shorter leaves, and their slightly more tomentose upper surface.—A robust, branching shrub, 2–6 feet high. *Branches* densely covered with crowded, spreading leaves, densely tomentose, as are the under surfaces of the leaves and branches of the corymbs. *Leaves* sometimes glutinous, narrow-linear, 1 inch long, spreading or recurved, often curving upwards, contracted at the base into a very short petiole, upper surface glabrous or nearly so, not shining, grey-green, margins recurved. *Corymbs* dense. *Involucres* elongated, turbinate; outer involucral scales acute, tomentose; inner with very short, inconspicuous, white, radiating tips.

8. **Ozothamnus bracteolatus** (Hook. fil.); fruticulus, ramulis foliis subtus corymbique ramis molliter albo-lanatis, foliis lato-linearibus subacutis basi lata subdecurrente sessilibus supra opacis nervis reticulatis marginibus recurvis costa subtus prominente, corymbo laxe ramoso ramis bracteolatis, capitulis turbinato-obconicis multifloris, involucri squamis hyalinis pallidis scariosis apicibus rugosis obtusis non radiantibus concoloribus, floribus radii fœmineis, acheniis puberulis. (*Gunn*, 497.)

Hab. Flinders' Island, *Gunn.*

A very distinct species, of which I have but one specimen; readily distinguished by the broad, subdecurrent bases of the broadly linear leaves, which, like those of *O. reticulatus*, have the veins impressed on the upper surface, and by the hyaline, scarious, shining scales of the involucre.—The leaves are about 1 inch long and ⅛ inch broad, subacute, not rigid and patent, densely woolly beneath, with a prominent midrib, pale green, glabrous, but not shining above. *Corymb* loose, the branches densely woolly, and covered with small, persistent bracts.

9. **Ozothamnus Antennaria** (Hook. fil.); fruticulus ramosus, glaberrimus, ramulis angulatis foliisque superne viscosis, foliis patulis obovatis obtusis integerrimis subtus albidis basi cuneatis in petiolum angustatis coriaceis enerviis, corymbis laxifloris pedunculis pubescentibus, capitulis multifloris, involucri squamis coriaceis pubescentibus oblongo-ovatis obtusis interioribus non albo-radiantibus, floribus radii paucis fœmineis, acheniis glaberrimis.—Swammerdammia Antennaria, *DC. Prodr.* vi. 164. (*Gunn*, 274.)

Hab. Mount Wellington and Western Mountains, elev. 3–4000 feet, *Fraser, Lawrence, Gunn, etc.*—(Fl. Jan.) (*v. v.*)

This is a very distinct species, of which De Candolle made the genus *Swammerdammia*, but I do not find any characters to distinguish it from *Ozothamnus*, the apices of the pappus-hairs not being more thickened than is usual in the genus.—A tall, glabrous shrub, 3–4 feet high. *Branches* angled, glutinous, as are the upper surface of the leaves, and often the involucral scales. *Leaves* ½–2 inches long, obovate or obovate-oblong, rounded at the apex, contracted at the cuneate base into a petiole, deep green above, white or tawny beneath. *Corymbs* lax. *Capitula* pedicelled, turbinate. *Involucral scales* imbricate, coriaceous, pubescent, the inner not white, nor radiating at the points.

§ 3. *Capitula corymbose. Inner involucral scales with white, radiating tips* (*see* O. reticulatus, *in* § 2).

10. **Ozothamnus Backhousii** (Hook. fil.); fruticulus erectus, ramulis foliisque supra glabris glutinosis, foliis erecto-patentibus subimbricatis brevissime petiolatis obovato-cuneatis obtusis subtus albo-tomentosis marginibus non recurvis, corymbi ramis brevibus, capitulis multifloris oblongo-turbinatis, squamis exterioribus scariosis obtusis interioribus breviter albo-radiantibus marginibus infra medium villosis, floribus exterioribus fœmineis, achenio glaberrimo.—Cassinia cuneifolia, *A. Cunn. in DC. Prodr.* vi. 155. (*Gunn,* 1165.) (Tab. LIV. *B.*)

Hab. Mount Wellington, elev. 3000 feet, *Fraser, A. Cunningham, Gunn;* Port Arthur, *Backhouse.*—(Fl. Jan.) (*v. v.*)

A very well marked species, and like no other Australian one, but so similar to the New Zealand *Cassinia Vauvilliersii*, that the presence of paleæ on the receptacle of that plant is almost the only character whereby it can be distinguished.—A small shrub, 1–3 feet high. *Branches* woody, erect. *Branchlets* and upper surface of leaves glabrous, shining, glutinous. *Leaves* rigidly coriaceous, $\frac{1}{4}$–$\frac{1}{3}$ inch long, suberect, loosely imbricating, obovate-cuneate, rounded at the apex, under surface densely tomentose. *Branches* of corymb short. *Capitula* rather long, many-flowered, with short, white, radiating, involucral scales.—Plate LIV. *B.* Fig. 1, capitulum; 2, scale of involucre; 3, flower; 4, pappus; 5, stamen; 6, arms of style:—*all magnified.*

11. **Ozothamnus ledifolius** (Hook. fil.); fruticulus robustus, ramosus, ramis ramulisque tomentosis, foliis confertis patentibus oblongo-linearibus obtusis coriaceis supra glabris opacis subtus albo- v. fusco-tomentosis marginibus revolutis, corymbis densis ramis brevibus, capitulis obconico-turbinatis sub-10-floris, involucri squamis exterioribus rubris fuscisve margine hyalinis interioribus albo-radiantibus, floribus exterioribus fœmineis, acheniis puberulis.—Cassinia ledifolia, *A. Cunn. in DC. Prodr.* vi. 155. (*Gunn,* 281, 498.)

Hab. Mount Wellington, Western Mountains, etc., elev. 3000 feet, *Fraser, etc.;* Flinders' Island, *Backhouse.*—(Fl. Jan.) (*v. v.*)

A small, rigid, woody shrub, 2 feet high, common on the mountains, but of which I have a specimen from Gunn marked as gathered in Flinders' Island by Backhouse.—*Branches* stout and woody, and branchlets short, covered with whitish or fuscous tomentum, as is also the under surface of the leaves. *Leaves* numerous, close set, patent or recurved, shortly linear or linear-oblong, blunt, $\frac{1}{3}$–$\frac{1}{2}$ inch long, coriaceous, upper surface glabrous, convex, with a deeply impressed midrib, not shining, margins recurved. *Corymb* dense. *Capitula* small, hardly $\frac{1}{4}$ inch long, obconic. *Outer involucral scales* hyaline at the margins, blunt, red or yellow or pale yellow-brown; inner with short, white, radiating tips.—The stout habit and much shorter leaves best distinguish this from *O. cinereus*, Br., the different habit, longer leaves, larger capitula, and much shorter, radiating involucral scales, from *O. ericæfolius.*

12. **Ozothamnus ericæfolius** (Hook. fil. in Lond. Journ. Bot. vi. 119); frutex erectus, ramosus, ramis elongatis ramulisque brevibus cano- v. fusco-pubescentibus, foliis parvis patenti-recurvis sessilibus breviter lineari-oblongis obtusis supra glabris subtus fusco-tomentosis marginibus recurvis, corymbis ad apices ramulorum numerosis subdensis, capitulis parvis pauci-(6–8)-floris, involucri squamis glutinosis nitidis interioribus sublonge radiantibus, acheniis pubescentibus. (*Gunn,* 1163.) (Tab. LVII. *B.*)

Hab. Marlborough, elev. 3000 feet, *Gunn.*—(Fl. Jan.)

A bush 7 feet high, with slender branches, covered with short branchlets, each terminated by a corymb of white capitula, which are hence excessively numerous.—*Leaves* small, spreading or recurved, $\frac{1}{4}$ inch long, linear-oblong, glabrous above, tomentose beneath, margin recurved. *Corymb* with short, slender branches. *Capitula* small, about as long as the leaves, rather narrow, few-flowered. *Involucres* yellow-white, shining; inner scales with rather long,

radiating, white tips.—PLATE LVII. *B*. Fig. 1 and 2, leaves; 3, capitulum; 4, scale of involucre; 5, flower; 6, pappus; 7, stamen; 8, arms of style:—*all magnified.*

13. **Ozothamnus rosmarinifolius** (Br. in Linn. Trans. xii. 124); frutex, ramis elongatis virgatis corymbique ramis dense albo-tomentosis, foliis sparsis patulis anguste linearibus mucronatis marginibus revolutis supra glabris muricatis hispidulisve subtus albo-tomentosis, corymbo conferto expanso polycephalo ramis patentibus gracilibus, capitulis albis rubrisve parvis 6–10-floris, involucri anguste turbinati squamis exterioribus scariosis araneosis interioribus sublonge albo-radiantibus, acheniis glabris.—*DC. Prodr.* vi. 165. Eupatorium rosmarinifolium, *Lab. Nov. Holl.* ii. 38. *t.* 181. Petalolepis rosmarinifolia, *Cass. Dict. Sc. Nat.* 39, 195. (*Gunn*, 836, 1166.)

Var. *β. brevifolia;* foliis brevioribus hispidulis, capitulis rubris. (TAB. LIV. *A.*)

HAB. Abundant by banks of streams in the central and northern parts of the Colony: Formosa, Grindelwald, Burghley, and Yorktown, *Gunn.*—(Fl. Dec., Jan.)

DISTRIB. South-eastern Australia: Victoria.

A tall and beautiful shrub, 6–9 feet high, with slender branches and branchlets, densely covered with soft, white tomentum. *Leaves* very narrow, linear, mucronate, spreading, scattered, ½–1½ inch long, upper surface minutely hispid or muricate, with small aculei, glabrous, under densely tomentose, margins recurved. *Corymbs* large, with numerous small, bright red or pale yellowish capitula. Inner involucral scales with rather long, spreading, white apices.—The var. *β* may be the *O. purpurascens*, DC. Prodr. vi. 165, but the leaves are not described as minutely hispid.—PLATE LIV. *A*. var. *β*. Fig. 1, leaf; 2, leaf of var. *α*; 3, capitulum; 4, scale of involucre; 5, flower; 6, pappus; 7, stamen; 8, arms of style:—*all magnified.*

14. **Ozothamnus Gunnii** (Hook. fil.); fruticosus, ramis robustis ramulisque dense albo-tomentosis, foliis patulis sparsis anguste elongato-linearibus acutis marginibus ad costam fere revolutis supra glaberrimis lævibus subtus cano-tomentosis, corymbis amplis polycephalis ramis patentibus, capitulis elongato-turbinatis sub-10-floris, squamis involucri exterioribus tomentosis interioribus albo-radiantibus, acheniis pubescentibus. (*Gunn*, 1256.)

HAB. Sand-hills by the seashore, near Georgetown, *Gunn.*—(Fl. Jan.)

A tall shrub, very similar in habit and general appearance to *O. rosmarinifolius*, Br., but the leaves are longer, perfectly glabrous and smooth on the upper surface: the capitula are considerably larger, and the achenia are pubescent. It also much resembles *O. turbinatus*, DC., but the capitula are smaller and narrower, the leaves sharp-pointed, and the radiating apices of the inner involucral scales longer.

15. **Ozothamnus thyrsoideus** (DC. Prodr. vi. 165); frutex ramosissimus, glaber, ramis ramulisque sulcatis junioribus puberulis, foliis anguste linearibus acutis obtusisve planis marginibus anguste revolutis superne glaberrimis viscosis (sicco nigris) subtus albidis costa nigra, capitulis sub-12-floris ad apices ramulorum brevium perplurimorum laxe corymbosis, pedunculis pedicellisque tomentosis, corymbis in paniculam thyrsoideam myriocephalam dispositis, involucri squamis externis pallidis pubescentibus marginibus late hyalinis interioribus longe albo-radiantibus, acheniis puberulis. (*Gunn*, 240, 704.)

HAB. Common in many parts of the Colony, ascending to 3000 feet, *Gunn, etc.*—(Fl. Nov.) (*v. v.*)

DISTRIB. South-eastern Australia: Victoria, *Mueller.*

A very beautiful plant, much resembling *Eurybia ramulosa*, but with very much smaller capitula and larger leaves.—A glabrous, erect, virgate bush, 6–8 feet high. *Branches* glabrous or slightly pubescent, deeply grooved. *Leaves* 1–2 inches long, numerous, spreading, very narrow-linear, blunt or sharp, flat, with narrow, recurved margins, glabrous or glutinous above, white below, with a distinct, dark-coloured midrib. *Corymbs* lax and few-flowered, terminating the extremely numerous, short, lateral branchlets, whence they form a large thyrsus, their

branches tomentose. *Capitula* small, about ten-flowered, with long, white, spreading inner involucral scales; the outer pubescent, with broad, membranous margins.

16. **Ozothamnus ferrugineus** (Brown in Linn. Soc. Trans. xii. 125); frutex erectus, ramosus, ramis sulcatis, ramulis subaraneo-tomentosis glabratisve, foliis patulis anguste lineari-lanceolatis acuminatis planis supra glaberrimis viscosisve subtus appresse cano-tomentosis marginibus tenuiter recurvis, corymbis densis ramosissimis subglobosis polycephalis ramulis gracilibus tomentosis, capitulis parvis anguste oblongis pauci-(6–8)-floris, involucri squamis externis pallidis late scariosis interioribus longe albo-radiantibus, achæniis puberulis.—*DC. Prodr.* vi. 165. Eupatorium ferrugineum, *Lab. Nov. Holl.* ii. 38. *t.* 180. Petalolepis ferruginea, *Cass. Dict. Sc. Nat.* xxxix. 195. Chrysocoma ferruginea, *Spr. Syst.* iii. 424. (*Gunn*, 494, 702.)

Hab. Not uncommon in various parts of the Colony, as at New Norfolk, Grindelwald, Hobarton, etc., *A. Cunningham, etc.*—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia: Victoria and New South Wales.

De Candolle describes this as very nearly allied to *O. rosmarinifolius*, from which it may be readily distinguished by the flat, less rigid leaves, not rough on the upper surface, and very different capitula; it is much more nearly allied to *O. thyrsoideus*, but distinguished by the tomentose branchlets, much longer, broader leaves, much larger, more branched, rounded, terminal corymbs, and smaller capitula. Some of the Australian specimens have much broader leaves than any Tasmanian.—A beautiful shrub, 6–9 feet high. *Leaves* 1½–3 inches long, sometimes ⅓ inch broad, covered with appressed white tomentum beneath. *Capitula* very small, with few (six to eight) flowers, narrow involucre, and comparatively long white rays.

Gen. XXI. RAOULIA, *Hook. fil.*

Capitulum multiflorum, heterogamum, discoideum. *Involucrum* oblongum; squamis scariosis, 1–2-seriatis, intimis erectis, disco æquilongis v. longioribus, radiantibus, albis. *Receptaculum* angustissimum, alveolatum v. fimbrilliferum, rarius pilosum. *Flores radii* ♀, 1-seriales, angustissimi, tubulosi, 3–4-dentati; *disci* ☿, 5-dentati; antheræ bicaudatæ. *Pappus* pilis sericeis tenuissimis 1-seriatis barbellatis floribus longioribus.—Herbæ *perpusillæ* Novæ-Zelandiæ *et* Tasmaniæ, *simpliciusculæ v. ramosæ, foliosæ;* foliis *imbricatis;* capitulis *sessilibus, solitariis, terminalibus.*

Very curious, and generally minute, alpine, simple or branching herbs, of which there are several New Zealand species; the genus is best distinguished from *Ozothamnus* and *Gnaphalium* by the extremely narrow receptacle. The species are often tufted and moss-like, with very small, smooth or woolly, loosely or densely imbricated leaves, and solitary terminal capitula sunk amongst the leaves at the ends of the branches.—*Heads* many-flowered; outer flowers in one row, female, slender, tubular, three- to four-toothed; inner hermaphrodite, tubular, campanulate, five-toothed. *Involucre* of several rows of erect scales, coriaceous or scarious, often spreading outwards when dry; inner scales as long as the florets, like the outer, or in some species radiating, with long or short white ligulæ. *Receptacle* extremely narrow, convex, alveolate or fimbrillate or hairy, hidden (even after the flowers have fallen away) by the involucral scales, which always connive at the base. *Stamens* of the disc-flowers five; *anthers* with two (sometimes fimbriated) tails; arms of the styles generally protruded, truncated, hispid at the points. *Achenia* smooth, glandular, or pubescent.—As a genus, this is not easily defined, except by its size and habit; it differs from *Ozothamnus* in the regular series of female flowers; from *Helichrysum* by its habit, and very narrow receptacle; from *Gnaphalium* by the same characters. (Named in honour of the late *M. M. E. Raoul*, surgeon in the French navy, author of the excellent 'Choix de Plantes de la Nouvelle-Zélande.')

1. **Raoulia catipes** (Hook. fil.); humilis, ramosa, foliosa, tomento subargenteo appresso candicans, foliis confertis sessilibus obovatis spathulatisve obtusis retusisve, involucri squamis oblongis obtusis

apice albis breviter radiantibus.—Gnaphalium catipes, *DC. Prodr.* vi. 236. Antennaria nubigena, *F. Mueller.* (*Gunn*, 322.) (Tab. LXI. *A.*)

Hab. Bare rocks on the summits of the loftiest mountains, *Gunn.*—(Fl. Feb.)

Distrib. Cobboras Mountain, Victoria, elev. 6000 feet, *Mueller.*

A very remarkable little plant, forming large tufts of a silvery white colour, the foliage, which densely covers the whole plant, being uniformly clothed with an appressed tomentum.—*Stems* 2–6 inches long, very much branched. *Leaves* spreading and recurved, sessile or contracted into a broad petiole, obovate or spathulate, blunt or retuse; their margins flat. *Capitula* sessile. *Involucral scales* blunt; outer tipped with white; inner longer, white from below the middle to the apex.—The leaves of Mueller's specimens are longer, and sometimes subacute.—Plate LXI. *A.* Fig. 1, flower of the circumference; 2, the same, with the pappus removed; 3, flower of disc; 4, hair of pappus; 5, arms of its style:—*all magnified.*

Gen. XXII. PTERYGOPAPPUS, *Hook. fil.*

Capitulum sub-6-florum; *floribus exterioribus* fœmineis, anguste tubulosis, inæqualiter 3-dentatis; styli ramis brevibus, inæqualibus; *interioribus* masculis, obtuse 5-dentatis; *antheris* basi biaristatis; *stylo* apice discoideo, bilobo. *Involucri* squamæ vix 2-seriatæ, oblongæ, valde coriaceæ. *Receptaculum* angustum, planum, nudum. *Achenium* obconico-oblongum, obscure 4-gonum, superne ciliatum. *Pappi* setæ sub-6, planæ, lineari-spathulatæ, distiche plumosæ.—Herba *alpina, musciformis, perennis, densissime cæspitosa, pulviniformis;* radicibus *crasse fibrosis;* caulibus *compactis, densissime foliosis, cum foliis obscure angulatis;* foliis *coriaceis, latissime spathulato-obovatis, abrupte acuminatis, concavis, basi vaginante submembranacea supra medium utrinque barbatis;* capitulis *solitariis, terminalibus, pedunculatis;* pedunculo *brevissimo, post anthesin elongato, rigido;* involucri squamis *oblongis, obtusis, floribus brevioribus.* (*Gunn*, 364.)

1. **Pterygopappus Lawrencii** (Hook. fil. in Lond. Journ. Bot. vi. 120). (Tab. LXI. *B.*)

Hab. On the summits of all the mountains, forming large, pulvinate masses, similar to, and growing along with, *Scleroleima* and *Oreobolus*, etc., *Lawrence, Gunn, etc.*—(Fl. Dec., Jan.) (*v. v.*)

An exceedingly curious, moss-like, tufted plant, very much resembling *Scleroleima* in habit, but recognized at once by the shorter, broader leaves, with villous hairs on their surfaces.—*Stems* 1 inch long, excessively densely compacted, emitting stout fibrous roots, closely covered with the imbricating leaves. *Leaves* obovate-spathulate, $\frac{1}{5}$ inch long, consisting of a broad, membranous, sheathing, lower portion, and a broader, coriaceous, concave lamina, which is acuminated, and furnished at the base on both surfaces with a transverse belt of shaggy hairs. *Capitula* solitary, terminal, shortly peduncled, very inconspicuous. *Involucral scales* about six, oblong, blunt, glabrous, shorter than the flowers. *Receptacle* naked. *Flowers* about six; outer very slender, unequally three-toothed; inner male, tubular, five-toothed. *Achenia* compressed or obscurely four-angled, ciliated above the middle. *Pappus* of four to six flat-feathered scales, as long as the corolla, gradually dilated from the base upwards. (Name from πτερυξ, *a wing*, and παππος, *down*; in allusion to the broad pappus.)—Plate LXI. *B.* Fig. 1, upper part of branch, peduncle, and capitulum; 2 and 3, leaves; 4, receptacle; 5, flower of circumference; 6, its pappus; 7, the flower, with the pappus removed; 8, corolla laid open; 9, achenium; 10, flower of disc; 11, the same, with pappus removed; 12, pappus; 13, stamen; 14, apex of style:—*all highly magnified.*

Gen. XXIII. LEPTORHYNCHUS, *Less.*

Capitulum multiflorum, homogamum. *Involucri* squamæ multiseriales, imbricatæ, appressæ, acuminatæ, siccæ, scariosæ. *Receptaculum* planum, ebracteolatum. *Corolla* tubulosa, 5-dentata. *Styli* rami apice subcapitellati. *Achenium* compressum, gracile, brevissime v. longius rostratum. *Pappi* setæ 10–12, basi subconcretæ, scabræ.—Herbæ *graciles;* ramis *ascendentibus, apice nudis, aphyllis, scarioso-bracteolatis,* 1-*cepha-*

lis; foliis *alternis, lineari-oblongis, sessilibus;* capitulis *majusculis;* involucris *subturbinatis obconicisve;* floribus *flavis.*

Of this genus about twelve species are known, all of them Australian, and the greater number natives of New South Wales.—*Herbs*, with slender, erect or ascending, leafy, simple or branched stems, terminating in bracteolate peduncles bearing solitary capitula. *Involucral scales* very numerous, imbricated in many series, white or pale hyaline, dry and scarious. *Flowers* numerous, all hermaphrodite. *Corollas* all tubular, five-toothed. *Styles* bifid, with capitate arms. *Achenia* with long or short beaks. *Pappus* of one row of slender hairs, that are somewhat combined at the very base, scabrid below and barbellate above. (Name from λεπτος, *slender*, and ῥυγχος, *a beak*.)

1. **Leptorhynchus squamatus** (Less. Synops. 273); pilosa v. glabrata, foliis anguste lanceolatis acuminatis marginibus recurvis subtus plus minusve albo-tomentosis pedunculis elongatis multibracteolatis, involucri squamis numerosissimis dense imbricatis apice brunneis acuminatis longe sparse villosis, acheniis glaberrimis brevissime rostratis, pappi setis supra medium barbellatis.—*DC. Prodr.* vi. 160. L. Lhotzkyanus, *Walp. in Linnæa,* xiv. 317. Chrysocoma squamata, *Lab. Nov. Holl.* ii. 40. *t.* 184. Helichrysum dubium, *Cass. Dict. Sc. Nat.* xx. 453 *et* xxv. 468. (*Gunn,* 118, 698, 1161.)

Hab. Abundant throughout the Colony.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia: Victoria and New South Wales.

Gunn remarks that this plant grows both on the mountains and low grounds, and that the mountain specimens are the most luxuriant.—A small herb, with many spreading, ascending, slender, wiry branches, a foot or more long. *Leaves* spreading, ½–1½ inch long, narrow-lanceolate, acuminate, margins recurved, under surface tomentose and white. *Peduncles* slender, covered with scattered, alternate, ovate-lanceolate, acuminate, white, hyaline bracteoles. *Capitula* broadly turbinate, ½–1 inch broad. *Involucral scales* extremely numerous, all white, scarious, and transparent, the upper with brown, acuminate tips.

2. **Leptorhynchus elongatus** (DC. Prodr. vi. 160); perennis, caulibus gracilibus suberectis ramosis, foliis anguste linearibus inferioribus subspathulatis ceteris sessilibus subacutis hispidulis marginibus recurvis, involucri squamis exterioribus lineari-lanceolatis scariosis, interioribus anguste lineari-elongatis viridibus, acheniis longe rostratis.—*Sonder in Linnæa,* xxv. 502. (*Gunn,* 1162.)

Hab. Not uncommon in various parts of the Colony: Hobarton, New Norfolk, Launceston, etc., *Gunn, etc.*—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia: Victoria and New South Wales.

A much larger plant than *L. squamatus*, with a thick, perennial root, and many stout, erect, branching stems, 1–2 feet long. Sonder refers the Tasmanian specimens to a variety (*β. Tasmanicus*), distinguished from the Australian state of the plant by the more glabrous, branching stem, rather smaller capitula, and shorter beak to the achenium; but I find these characters to be all very variable.—*Leaves* almost hispid, 1–3 inches long, narrow-linear, with blunt points and recurved margins; lower gradually dilated upwards; upper sessile. *Capitula* larger than in *L. squamatus*, with few involucral scales, the inner of which are much longer and more herbaceous. *Achenia* with long beaks.

Gen. XXIV. PODOLEPIS, *Lab.*

Capitulum multiflorum, heterogamum; *floribus* radii fœmineis, ligulatis v. tubuloso-difformibus; disci tubulosis, hermaphroditis, 5-dentatis. *Involucri* campanulati squamæ multiseriales, scariosæ, siccæ, interiores unguiculatæ. *Receptaculum* paleaceum. *Styli* rami apice capitellati. *Antheræ* basi setiferæ. *Achenium* oblongum. *Pappus* 1-seriatus, setis scaberulis basi in annulum concretis.—Herbæ *habitu* Leptorhynchi.

A rather extensive genus, wholly confined to Australia, consisting of about twenty-five species, of which the

majority are natives of the South-west quarter of the Continent. Their habit is quite that of *Leptorhynchus*, though most of them are large plants.—*Stems* herbaceous, slender, simple or branched. *Leaves* alternate, sessile. *Capitula* in terminal peduncles, campanulate, with many imbricate, dry, scarious, diaphanous involucral scales, the inner of which are stipitate, with spreading, short laminæ. *Receptacle* paleate. *Flowers* very numerous, yellow; *outer* slender, female, with an oblique, unequal mouth to the corolla; *inner* five-toothed. *Anthers* with two setæ. *Styles* with capitate arms. *Achenia* not rostrate, oblong, crowned with a pappus of one row of slender, scabrid hairs, united at the very base. (Name from πους, *a foot*, and λεπις, *a scale*; in allusion to the stipitate inner involucral scales.)

1. **Podolepis acuminata** (Br. in Ait. Hort. Kew. ed. 2. v. 82); foliis radicalibus petiolatis lanceolatis oblongo-spathulatisve glabris acutis acuminatisve 1–3-nerviis caulinis sessilibus lineari-lanceolatis marginibus recurvis, ramis superne araneo-tomentosis glabratisve pauci-bracteolatis, involucri squamis exterioribus ovato- v. oblongo-lanceolatis subacutis obtusisve interioribus elongatis planiusculis, achæniis papillosis, pappi setis scaberulis.—*DC. Prodr.* vi. 162. Scalia jaccoides, *Bot. Mag.* 956. (*Gunn*, 110, 362.)

Hab. Abundant in many parts of the Colony, ascending to 4000 feet, *Gunn.*—(Fl. Nov.)

Distrib. South-eastern Australia: Victoria and New South Wales.

I am doubtful whether this may not prove a variety of the true *P. acuminata*, from which it differs only in the much blunter involucral scales.—*Stems* 1½–2 feet high, stout, rigid, smooth and polished, loosely araneose above or glabrous. *Leaves* very variable in size and shape: radical often petiolate, flat and three-nerved, acuminate, perfectly glabrous or with pubescent margins: cauline sessile, almost decurrent, linear, 1–4 inches long, with recurved margins. *Capitula* solitary or several together, 1–2 inches broad. *Pedancles* bracteate and woolly. *Scales* of the involucre flat or concave, not transversely rugose; outer ovate or obovate, blunt; inner with a straight, linear, rigid stipes, and blunt, elliptical or oblong lamina. *Flowers* of circumference with a large, trifid ray.

Gen. XXV. MILLOTIA, *Cass.*

Capitulum multiflorum, homogamum. *Involucri* oblongo-cylindracei squamæ 8–10, 1-seriatæ, lineares, herbaceæ, margine et apice submembranaceæ. *Receptaculum* planum, nudum. *Corolla* tubulosa, 4–5-dentata. *Styli* rami obtusi, cono minimo superati. *Antheræ* caudatæ. *Achenium* lineare, compressum, rostro tenui superatum. *Pappus* 1-seriatus, scaber, corollam superans.—Herba *gracilis, pusilla, cano-tomentosa, annua, ramosa;* foliis *alternis, angustis, integerrimis;* capitulis *terminalibus, solitariis;* floribus *flavis.*

1. **Millotia tenuifolia** (Cass. in Ann. Sc. Nat. 1829, p. 31; Dict. Sc. Nat. lx. 592; Less. Synops. 273; DC. Prodr. vi. 161).—M. myosotidifolia, *Steetz, Pl. Preiss.* i. 457. Senecio myosotidifolius, *Benth. En. Plant. Hügel.* 66. (*Gunn*, 164.)

Hab. Common in dry, stony places, *Gunn, etc.*—(Fl. Oct., Nov.) (*v. v.*)

Distrib. Victoria, South Australia, King George's Sound, and Swan River.

A very curious little plant, which hardly appears to me to belong to the tribe in which it is placed, though I am not able to place it better. It has much the habit of some Asteroid genera; both the pappus is more rigid than is usual in the *Helichryseæ*, and the styles are not very typically Senecioid. De Candolle describes the stigmata as surmounted with a minute cone, which I do not observe, and the pappus as being red, which however is white in all my very numerous specimens from Australia and Tasmania. In habit and general appearance it somewhat resembles *Eurybiopsis*.—A small, annual herb, covered with loose, white, woolly tomentum, from 1–6 inches high. *Stems* very slender or stout, simple or branched. *Leaves* few, slender, alternate. *Capitula* terminal on the naked ends of the branches, ½–⅔ inch long. *Involucre* oblong, its scales few, in one series, linear-acuminate, to-

mentose on the back, the margins and apex membranous, sometimes purple. *Flowers* uniform, tubular, four- or five-toothed. *Anthers* with no tails, or extremely short ones, if (as described by De Candolle) they are really present. *Achenium* long, slender, and surmounted by a filiform beak that carries the slender, scabrid hairs of the pappus, when moistened surrounded with a mucous coat. (Origin of name unknown to me.)

Gen. XXVI. HELICHRYSUM, *Vaill.*

Capitulum multiflorum, homogamum v. heterogamum; floribus omnibus hermaphroditis tubulosis 5-dentatis, v. paucis in ambitu fœmineis gracillimis. *Involucri* squamæ scariosæ, imbricatæ, interiores conniventes v. radiantes. *Receptaculum* planum, epaleaceum, nudum, areolatum v. fimbrilliferum. *Achenium* erostre, sessile. *Pappus* 1-serialis, setis scaberulis liberis v. basi inter se varie concretis.—Herbæ *v.* suffruticuli, *habitu variæ;* foliis *alternis;* capitulis *scapos elongatos v. ramos foliatos nudosve terminantibus;* involucris *flavis albis roseisve;* floribus *plerisque luteis.*

This fine genus is for the most part South African and Australian, but few species being found in South Europe, Asia, the African Islands, and New Zealand. About fifty Australian species are known, the majority of which are natives of the south-eastern quarter of the Continent or of Tasmania; several are common to the south-eastern and south-western quarters, and there are also several species confined to the Tropics. All are herbs, or have shrubby stems below, often woolly, generally showy capitula; some have scapes, others branching stems. The colour of the involucre is usually either white or yellow, but a few are pink, and some vary from white to deep golden yellow.—*Leaves* cauline and alternate or radical and tufted. *Flowers* either all hermaphrodite, tubular and five-cleft, or a few in the circumference female and very slender, on a flat or conical, smooth, areolated or fimbrilliferous receptacle. *Involucre* of many dry, scarious, imbricating scales, the inner long and radiating, or short and conniving. *Pappus* of one row of long, rough hairs (not plumose), all free or connected at the base. (Name a Greek one, erroneously supposed to have been applied to a European species of this or an allied genus.)

§ 1. Chrysolepidea.—*Involucral scales with bright yellow rays.*

1. **Helichrysum bracteatum** (Willd. En. Plant. 869); herbaceum, caule simplici v. ramoso scaberulo v. glaberrimo superne interdum tomentoso, foliis lineari- v. oblongo-lanceolatis linearibusve acuminatis caulinis sessilibus v. ½-amplexicaulibus marginibus recurvis subrepando-sinuatis integerrimisve superne scaberulis subtus glaberrimis v. utrinque glaberrimis, capitulis magnis intense aureis, involucri glaberrimi squamis chartaceo-scariosis concavis exterioribus ovatis subacutis interioribus breviter stipitatis radiantibus oblongo-lanceolatis acuminatis, achenio glaberrimo.—H. bracteatum *et* H. acuminatum, *DC. Prodr.* vi. 188. H. macrocephalum, *A. Cunn.* H. Banksii, *A. Cunn.; DC. l. c.* H. bicolor, *Lindl. Bot. Reg. t.* 1814. H. chrysanthum, *Pers. Ench.* ii. 414. Xeranthemum bracteatum, *Vent. Malm.* ii. *t.* 2. (*Gunn,* 111, 244, 247, 687, 688, 838.)

Variat insigniter; *statura* 6 unc. ad 3-pedali, habitu robusto v. gracili, simplici v. ramoso; *caulibus* strictis v. flexuosis, foliosis v. nudis, apice bracteatis v. ebracteatis, glaberrimis v. hispidulis v. superne araneo-tomentosis; *foliis* radicalibus spathulato-lanceolatis amplis v. caulinis subsimilibus, caulinis 1–4-pollicaribus anguste linearibus v. oblongo-lanceolatis rarius spathulatis sparsis confertisve scaberulis glaberrimisve basi sessilibus, semiamplexicaulibus v. biauriculatis; *capitulis* 1–2½ unc. latis intense aureis v. fid. DC. albis; *involucri* squamis exterioribus subacutis, acutis, acuminatisve.

Hab. Abundant throughout the Island, especially in marshy situations, ascending to 4000 feet elevation.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. Throughout Australia, from Port Essington on the north coast to Victoria and Swan River, ascending to 6000 feet on the Australian Alps, *Mueller.* (Cultivated in England.)

I must leave it to the Colonial Botanist to determine if there be more than one species included here under the name of *H. bracteatum*. I have most carefully examined a multitude of dried specimens from all parts of Australia, in the vain attempt of finding any characters whereby they may be distinguished; and if, as De Candolle affirms, this species has sometimes white capitula, I fear that a good many other spurious species will have to fall into it. There is no difficulty whatever in selecting several extremely different forms of this species, and if the characters used by De Candolle to distinguish *H. acuminatum* and *H. Banksii* were constant, they would perhaps indicate the most prominently different forms; but I do not find that Mr. Gunn pays any attention to the fact that specimens with acuminate outer scales occur in the same gathering with others in which these are almost blunt, and that those with woolly stems are mixed with others with glabrous ones: further, every intermediate form in habit, size, shape, etc., of the leaves and involucral scales, may be found uniting the most dissimilar individuals. It appears certain however that marked forms do prevail over large tracts of ground, and that sometimes two such dissimilar forms grow together, still retaining their differences with more or less constancy, so that I would recommend the species to the attention of local observers.—A rigid, herbaceous species, with erect, simple or branched stems, 6 inches to 3 feet high. *Stems* glabrous or hispid, sometimes tomentose or woolly above, terminating in naked or bracteate peduncles bearing large, deep yellow capitula, 1–2½ inches broad. *Leaves* few or many, sessile or semi-amplexicaul or cordate at the base, of all forms from very narrow-linear to spathulate-oblong, acuminate, glabrous on both sides or hispid above, margins recurved, rather wavy. *Capitula* deep golden-yellow; scales of the involucre very coriaceous and shining, quite glabrous; outer ovate, acute or acuminate; inner with short stipites and long, lanceolate, concave, acuminate rays. *Hairs* of the pappus pilose, with a few longer bristles at the tips. *Flowers* of the ray slender, female.

2. **Helichrysum scorpioides** (Lab. Nov. Holl. ii. 45. t. 191); herbaceum, subscapigerum, laxe lanuginosum, ramis scapisve monocephalis, foliis anguste lineribus lanceolatis subspathulatisve superioribus angustioribus acuminatis et longe apiculatis glabratis sublanatis v. superne scaberulis margimbus recurvis, capitulis ebracteatis aureis, involucri squamis exterioribus oblongis obtusis, interioribus substipitatis linearilanceolatis basi sublanatis, acheniis glaberrimis.—*DC. Prodr.* vi. 194. Gnaphalium scorpioides, *Poir. Suppl.* ii. 129. H. buphthalmoides, *Sieb. Pl. Exsicc.* 333. H. Gunnii, *Nob. in Hook. Ic. Plant. t.* 320. (*Gunn*, 116, 502, 1171.)

Hab. Abundant throughout the Island, especially in moist places, ascending to 4000 feet.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern and Southern Australia, from Adelaide to Port Jackson.

A slender, herbaceous, generally graceful species, more or less covered everywhere with soft, araneose wool. *Stems* many or few from the root, ascending, unbranched above or forming scapes bearing solitary capitula. *Leaves* linear-lanceolate or subspathulate, soft and lanate or glabrescent, rarely scaberulous on the upper surface, margins slightly recurved, acuminated, the apex terminating in a slender bristle; upper part of stem or peduncle ebracteate, but with short, subulate scales. *Capitula* ⅔–1 inch across, rather flat, with a very short ray; outer scales of the involucre linear-oblong, numerous, scarious, membranous, blunt, rather rugose, often reddish; inner stipitate, the stipes lanate. *Hairs* of the pappus scabrid.—Dr. Mueller sends a variety of this, from Victoria, with white capitula.

3. **Helichrysum semipapposum** (DC. Prodr. vi. 195); lanatum v. pubescens, erectum, caule ramoso rigido apice corymboso, foliis anguste lineari-elongatis acuminatis apice subpiliferis marginibus revolutis subtus v. utrinque tomentosis rarius glabratis, corymbi polycephali ramis lanatis, capitulis parvis subcampanulatis v. hemisphæricis basi lanatis, squamis scariosis aureis numerosis imbricatis interioribus vix radiantibus acutis omnibus ciliatis apicibus rectis recurvisve.—Gnaphalium semipapposum, *Lab. Nov. Holl.* ii. 42. *t.* 187; *Sieb. Pl. Exsicc.* 335. Chrysocephalum helichrysoides, *Walp. in Linnæa*, xiv. 503; *Sonder in Linnæa*, xxv. 516. (*Gunn*, 113, 504, 246, 1173.)

Variat—*caule* gracili v. robusto foliisque molliter araneoso-tomentosis pubescentibus v. superne scaberulis; *foliis* sparsis subfasciculatisve, erectis patulis recurvisve, acutis acuminatis v. in apiculum elongatum desinentibus, anguste v. latius linearibus, basi angusta v. latiore subamplexicauli v. biauriculato.

Var. β. *latifolium;* foliis amplis lanatis.—Chrysocephalum asperum, *Steetz, Pl. Preiss.* i. 174.

Var. γ. *filifolium;* foliis fere filiformibus.

Var. δ. *ramosum;* caule basi ramoso, foliis linearibus.

Var. ε. *scabridum;* hispido-pilosum, vix lanatum.—Chrysocephalum asperum, var., *Steetz, l. c.*

Hab. Common in many parts of the Island.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern Australia: New South Wales and Victoria, ascending the Grampians, *Mueller.*

A very handsome plant, 1–3 feet high, easily recognized by its stout, rigid, seldom branched stem, bearing a terminal corymb of many small, golden capitula, and by its narrow-linear leaves.—*Stems* woolly or pubescent, rarely hispid. *Leaves* spreading or erect, solitary or fascicled, often bearing slender, short, leafy branches in their axils, linear, 1½–3 inches long, very variable in breadth, acuminate, with usually a slender piliferous point, margins strongly recurved, sessile, semiamplexicaul or auricled at the base. *Capitula* very numerous, ⅓ inch long, campanulate or hemispherical, on woolly pedicels. *Scales of involucre* numerous, closely imbricate, ciliate, acute, often with recurved apices; inner scales hardly radiating. *Achenia* glabrous. *Pappus* of few, slender hairs, with clavate tips, which bear long cilia. *Outer florets* female, with very slender corollas.

4. **Helichrysum apiculatum** (DC. Prodr. vi. 195); herbaceum, molliter dense araneoso-tomentosum, caulibus e basi ramosis ascendentibus erectisve simplicibus apice polycephalis corymbosis, foliis spathulato-lanceolatis acuminatis utrinque lanatis, corymbis 3-polycephalis aureis, involucri squamis lineari-oblongis laxe imbricatis exterioribus glabris interioribus linearibus acuminatis stipitatis ciliatis, stipite lanato pubescente rarius glabrato.—Gnaphalium apiculatum, *Lab. Nov. Holl.* ii. 43, 188; *Ker, Bot. Reg. t.* 240; *Sieb. Pl. Exsicc.* 562 *et* 584. H. flavissimum, *DC. l. c.* (*Gunn,* 112.)

Hab. Abundant throughout the Island.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. South-eastern Australia: from Port Jackson to Victoria. (Cultivated in England.)

A handsome species, easily distinguished from *H. semipapposum* (to which it is allied), by being much more woolly, the stems more ascending, less strict and rigid, the leaves broader, spathulate, more flat, acute, and woolly on both surfaces, by the much fewer, larger capitula in the corymb, and by the fewer, longer, less closely imbricate, involucral scales. *Outer flowers* female. *Pappus* clavellate, with long hairs at the tip.—I am inclined to suspect that the *H. semipapposum*, var.? β. *Gunnianum* of De Candolle, belongs to this, if not, as he himself suggests, to *scorpioides.* It is often in this, as in other genera, impossible to determine to what species individual specimens of many of the commonest and best marked species should be referred.

§ 2. *Capitula white or pinkish.*

5. **Helichrysum papillosum** (Lab. Nov. Holl. ii. 46. t. 192); herbaceum, erectum, totum papilloso-puberulum pilosumve, caule simplici v. diviso robusto folioso, foliis linearibus lineari-lanceolatisve acuminatis planiusculis basi sessilibus semiamplexicaulibusve, capitulis magnis solitariis terminalibus, involucri squamis albis fuscescentibusve chartaceo-scariosis concavis glaberrimis lanceolatis acuminatis laxe imbricatis intimis stipitatis radiantibus, pappi setis scaberulis.—*DC. Prodr.* vi. 189. H. glabratum, *DC. l. c.?* H. macranthum, *Benth. Plant. Hügel.* 65. H. niveum, *Graham in Bot. Mag.* 3857; *Steetz in Plant. Preiss.* i. 471. Gnaphalium papillosum, *Poir. Suppl.* ii. 129. (*Gunn,* 500.)

Hab. Gun-carriage Island, Bass' Straits, Port Arthur, and Cape Raoul, Tasman's Peninsula, *Gunn.*—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern and South-western Australia. (Cultivated in England.)

Apparently a maritime species in Tasmania, most nearly allied to *H. bracteatum*, but differing in the white involucre and papillose stem and leaves. The outer involucral scales are however at times yellowish, suggesting the possibility of all being sometimes found to vary to yellow.—*Stems* robust, annual, 1–1½ inch high, leafy, simple or sparingly branched, covered with minute pubescence, the hairs arising from papillæ on the surface of the cuticle. *Leaves* 2–4 inches long, sessile or half-clasping the stem, linear-lanceolate or subspathulate, acuminate, pubescent. *Capitula* very large, 2–3 inches across, with glabrous, loosely imbricating, coriaceous, scarious, white, concave scales; the inner radiating; the outer fuscous or yellowish or sometimes dirty red at the tips.

6. **Helichrysum leucopsideum** (DC. Prodr. vi. 193); suffruticulus ramosus, caulibus ramosis rigidis ascendentibus laxe araneosis scaberulisve, foliis subspathulato-lanceolatis sessilibus acutis subtus tomentosis superne pilosis scaberulis glabratisve marginibus revolutis undulatis, capitulis magnis bracteatis albis roseisve, involucri squamis glaberrimis laxe imbricatis anguste lineari-lanceolatis sensim acuminatis interioribus elongatis radiantibus. (*Gunn*, 499, 426.) (Tab. LIX.)

Hab. St. Mary's Pass, Fingal; sand hills, Georgetown, Flinders' Island, and Western Port, *D'Urville, Gunn, etc.*—(Fl. Jan., Feb.)

Distrib. South coast of Australia, from Victoria to Swan River.

Stems sometimes woody, and the plant forming a small bush, at others slender, generally numerous, a foot long, branching, ascending, and, as well as the leaves, covered more or less with lax tomentum or somewhat scabrid pubescence. *Leaves* 1–2 inches long, very variable in breadth, more or less linear-lanceolate or spathulate, acute, tomentose below. *Capitula* large, 1–2 inches broad, bracteate at the very base of the involucre, with tomentose leaves. *Involucral scales* shining, white or delicately rose-coloured, narrow-linear, acuminate, loosely imbricated, the inner radiating. *Pappus* hairs slender, almost smooth or slightly scaberulous, scabrid towards the tips. *Outer flowers* female.—Plate LIX. Fig. 1, scale of involucre; 2, floret; 3, pappus; 4, corolla laid open; 5, stamen; 6, arms of style:—*all magnified.*

7. **Helichrysum dealbatum** (Lab. Nov. Holl. ii. 45. t. 190); subscapigerum, herbaceum, caulibus gracilibus ascendentibus erectisve scapiformibus tomentosis 1-cephalis, foliis lineari- v. oblongo- v. spathulato-lanceolatis acuminatis subtus argenteo-tomentosis supra glaberrimis, capitulis magnis, involucri basi lanati squamis glabris albidis exterioribus ovato-oblongis acutis striatis roseis intimis longe radiantibus albis. —*DC. Prodr.* vi. 189. Gnaphalium niveum, *Poir. Suppl.* ii. 129, *non Linn.* (*Gunn*, 689.)

Hab. Generally in a poor, wet soil: Hobarton, Georgetown, Circular Head, and Flinders' Island, *A. Cunningham, Gunn, etc.*—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. South-eastern Australia.

A very pretty, delicate little species, 10–18 inches high. *Stems* branched at the very base, erect or ascending, slender, sparingly leafy, hence scape-like, tomentose, bearing one large, terminal, white capitulum. *Leaves* chiefly radical, spreading, lanceolate, linear or oblong or spathulate, acuminate, white below, with appressed, silvery tomentum, glabrous above; cauline smaller, narrower. *Heads* large for the size of the plant, 1¼–2 inches across. *Involucre* very broad; outer scales linear-oblong, acute, white or pink, striated, blunt; inner narrow-linear, strict, radiating, much longer than the florets, with short stipites, all quite glabrous. *Flowers* small. *Pappus* clavellate at the apex.

8. **Helichrysum pumilum** (Hook. fil.); parvulum, cæspitosum, scapigerum, foliis omnibus radicalibus confertis coriaceis basi imbricatis subvaginantibus strictis anguste linearibus acutis superne convexis canaliculatis glaberrimis subtus albo-tomentosis marginibus revolutis, scapo tomentoso v. lanato bracteis linearibus, capitulo solitario albo v. roseo basi tomentoso, squamis radiantibus multiseriatis linearibus obtusis interioribus longioribus floribus multoties longioribus. (*Gunn*, 2045.) (Tab. LX. *A.*)

Var. β; foliis superne latioribus subspathulatis.

Hab. Heathy and peaty ground, Mount Sorrell, Macquarrie Harbour, *Gunn, Milligan*. Var. β. Macquarrie Harbour, *Milligan*.—(Fl. Dec.)

Much the smallest species known to me, and of a different habit from any but the following, being tufted, 4–6 inches high, and scapigerous. *Leaves* 1–1½ inch long, narrow-linear, somewhat spathulate in var. β, coriaceous, channelled above down the centre or convex, shining, glabrous above, white below with appressed, silvery tomentum. *Scapes* woolly, slender, with a few linear bracts. *Capitula* ½–⅔ inch across. *Scales of the involucre* numerous, glabrous, spreading, all white or with the outer rosy, linear, blunt; the inner very numerous, white, much longer than the flowers, radiating. *Pappus* clavellate. *Flowers* dark red.—Possibly a variable species, but I have only seen specimens from one spot.—Plate LX. *A*. Fig. 1, leaf; 2, flower; 3, hair of pappus; 4, anther; 5, arms of style:—*all magnified.*

9. **Helichrysum Milliganii** (Hook. fil.); scapigera, radice crassa, foliis radicalibus confertis patentibus coriaceis elliptico- v. oblongo-spathulatis acutis glaberrimis, petiolo late vaginante scapo robusto araneoso bracteato, bracteis foliaceis oblongo-lanceolatis sessilibus araneosis, capitulis magnis albis, squamis glaberrimis acuminatis exterioribus albis rubrisve lineari-oblongis interioribus albis radiantibus floribus multoties longioribus. (*Gunn*, 1169.) (Tab. LX. *B*.)

Hab. Summit of Mount Pearse, Surrey Hills, elev. 3000 feet, Mount Sorrell, Macquarrie Harbour, *Milligan*.—(Fl. Jan.)

A very beautiful and most distinct species, 4–8 inches high, forming apparently single plants.—*Root* perennial, stout. *Leaves* all radical, densely crowded, ½–1 inch long, very coriaceous, oblong or lanceolate-spathulate, acute, with broad, dilated, sheathing petioles, glabrous on both surfaces. *Scapes* solitary, stout, curving or erect, tomentose, covered with foliaceous bracts, ⅓–⅔ inch long. *Bracts* araneose, erect. *Capitulum* large, solitary, 1½ inch across, broad. *Involucral scales* spreading, acuminate; the outer ovate, white or dull red, or with red margins; inner linear or linear-lanceolate, much longer than the flowers, white, spreading. *Flowers* yellow-red. *Pappus* hairs barbellate, with longer hairs towards the tips of each.—Plate LX. *B*. Fig. 1, flower; 2, hair of pappus; 3, stamen; 4, arms of style:—*all magnified.*

Gen. XXVII. HELIPTERUM, *DC.*

Omnia *Helichrysi*, sed pappus plumosus.

This genus, separated by De Candolle from *Helichrysum* on account of the hairs of the pappus being plumose, and not scabrid or pilose, is hardly tenable, various species being quite intermediate between them, in so far as this character is concerned; in habit and in all other respects the genus is not distinguishable from *Helichrysum*. The species are all South African and Australian; about twenty are known in the latter country, which are almost equally distributed between the south-eastern and south-western quarters, none being common to both. (Name by ellipsis from *Helichrysum*, combined with πτερος, *a wing*; in allusion to the feathery pappus.)

1. **Helipterum incanum** (DC. Prodr. vi. 215); herbaceum, scapigerum, incano-tomentosum v. lanatum, caulibus basi lignosis brevibus, foliis plerisque radicalibus anguste lanceolatis lineari-elongatis filiformibusve subacutis integerrimis marginibus undulatis planis v. recurvis, scapis infra medium foliatis gracilibus apice nudis 1-cephalis, capitulo magno albo, involucri squamis obtusis exterioribus rubris v. fuscis breviter oblongis interioribus stipitatis linearibus obtusis, stipite gracili pubescente apice lanato.—*Hook. Ic. Pl. t.* 318. H. bicolorum *et* H. albicans, *DC. l. c.* (*Gunn*, 124, 837, 108, 442, 239.)

Var. β, *tricolor*; squamis extimis purpureis, mediis flavidis, intimis albis.—*DC. l. c.* Helichrysum incanum, *Hook. Bot. Mag. t.* 2881.

Hab. Northern parts of the Island, at all elevations: Circular Head; Mount Pearse, elev. 3000 feet; Norfolk Plains, etc., *Lawrence, Gunn*.—(Fl. Nov., Dec.)

Distrib. South-eastern Australia, Victoria, and New South Wales. (Cultivated in England.)

A very beautiful plant, a foot or so high, often forming large, tufted masses, covered densely with soft, white tomentum.—*Stems* woody at the very base, branching, divided close above the root into many ascending or erect, tufted, short branches, which are densely leafy below, and suddenly terminate in slender scapes, bearing a few linear leaves, and one large, white capitulum. *Leaves* 2–5 inches long, numerous, erect, softly tomentose, narrow-linear, or almost thread-like, with flat or revolute, sometimes crisped margins. *Capitula* ½–2 inches broad. *Scales* of the involucre blunt; outer oblong, brown or purple-red; inner stipitate, with long, radiating, linear rays. *Achenia* glabrous. *Pappus* feathery, the setæ terminating in a thickened apex.—Luxuriant specimens have more leafy stems, not resembling scapes. Mueller sends an alpine variety from the Alps of South Australia, covered with a dense, soft, snow-white tomentum, and having leafy scapes, and oblong-spathulate, short leaves. The figure in the 'Botanical Magazine' represents the interior scales of the involucre as yellow, but they are white in all my specimens.

2. **Helipterum anthemoides** (DC. Prodr. vi. 216); glaberrimum, ramis ramulisque virgatis foliatis, foliis sparsis sessilibus brevibus linearibus obtusis acutisve grosse glanduloso-punctatis basi in appendicem albam ramo adnatam productis, capitulis solitariis terminalibus nudis, involucro basi hemisphærico, squamis exterioribus brevibus obtusis subhyalinis, interioribus longe radiatis subacutis, achenio dense sericeo, pappi pilis dense plumosis basi planis subpaleaceis.—Helichrysum anthemoides, *Sieb. Plant. Exsicc.* 344; *Spreng. Syst. Veg.* iii. 484. H. punctatum, *DC. l. c.* (*Gunn*, 239.) (Tab. LXI.)

Hab. Formosa, Western Mountains, Launceston, etc., ascending to 3500 feet, *Lawrence*, *Gunn*.—(Fl. Nov., Dec.)

Distrib. New South Wales, South Australia, and Victoria.

A very distinct species, and, I think, almost generically separable on account of the rigid pappus, the hairs of which are few and broad, and flattened below; the achenium too is broad and densely silky, and the involucre hemispherical at the base, and there covered with scarious, hyaline scales. I can find no difference between De Candolle's *punctatum* and *anthemoides;* the dotted leaves were apparently overlooked in the description of the latter by that author.—*Root* woody, sending up very numerous, slender, twiggy, simple (or sometimes branched and bushy) stems, 1–2 feet high, perfectly glabrous everywhere. *Leaves* scattered, small, narrow-linear, rarely linear-lanceolate, acute, punctate (rarely not so), attached by a broad, adnate base to the branch, the upper becoming scarious at the tips, and passing into scarious bracts below the capitulum, the peduncle of which is sometimes slightly tomentose (in Australian specimens). *Capitula* solitary, about 1 inch broad, glabrous, the lower outer scales fuscous or yellow-brown; the inner long, white, and radiating.—Plate LXI. Fig. 1, leaf; 2, flower; 3, hair of pappus; 4, corolla; 5, stamen; 6, arm of style:—*all magnified.*

Gen. XXVIII. GNAPHALIUM, *L.*

Capitulum multiflorum; *floribus* omnibus gracilibus, tubulosis; *radii* pluriserialibus tenuissimis fœmineis; *disci* hermaphroditis. *Involucri* ovati v. hemisphærici squamæ imbricatæ, appressæ v. patulæ, subhyalinæ, discum æquantes. *Receptaculum* planum, nudum. *Antheræ* basi bisetæ. *Achenia* parva, teretiuscula, sæpe papillosa. *Pappus* 1-serialis, setis tenuissimis scaberulis.—Herbæ *plus minusve lanatæ;* foliis *alternis, sessilibus;* capitulis *in glomerulos corymbosve dispositis, interdum axillaribus spicatisve;* involucri *squamis pallidis, flavis subpurpureisve.*

A large genus, scattered over the whole world, not easily distinguished from *Helichrysum* by any technical characters, but very unlike that genus in the form of the capitulum and general appearance. About ten Australian species are known, of which several are also New Zealand plants, and one or two are found over all the world; none are peculiar to South-western Australia.—*Herbs*, with simple or branched stems, and alternate leaves, always more or less tomentose or woolly. *Capitula* axillary or corymbose or spicate or fascicled or capitate, generally narrow

or hemispherical, with no ray. *Involucral* scales imbricating, as long as the flowers, erect or slightly patent, often scarious. *Receptacle* flat, naked. *Flowers* very numerous, all slender and tubular; the outer female, filiform, in several series. *Pappus* of one series of slender, scaberulous setæ. *Achenia* small, oblong, terete, often papillose. (Name from *γναφαλον, wool.*)

1. **Gnaphalium luteo-album** (Linn. Sp. Pl. 1196); erectum, herbaceum, dense lanatum, caule simplici v. basi ramoso, ramis simplicibus laxe foliosis, foliis lineari-oblongis v. spathulatis linearibusve lineari-lanceolatisve utrinque lanatis, capitulis subcapitatim corymbosis, involucri hemisphærici squamis nitidis fuscis v. flavescentibus.—*DC. Prodr.* vi. 230; *Engl. Bot. t.* 1002; *Fl. N. Zeal.* i. 139. G. moschatum, *A. Cunn. MSS.; DC. Prodr.* vi. 236. (*Gunn,* 41, 409.)

Hab. Abundant in rocky places, and wet or dry pasture-land.—(Fl. Oct.–Jan.) (*v. v.*)

Distrib. Throughout Australia, from north to south, and in all parts of the world, tropical and temperate, except the colder temperate and polar regions. (A native of England.)

An extremely common and variable plant, so variable, indeed, that it is difficult to define it.—More or less densely covered with soft, white, appressed tomentum. *Stems* 6 inches to 1½ foot high, ascending or erect, stout or slender, simple or branched (sometimes proliferously in the axils of the leaves). *Capitula* hemispherical, shining, about ¼ inch long, corymbose or almost capitate, sometimes corymbose above and collected in heads along the lower parts of the stem or branches. *Involucral* scales golden-yellow or fuscous, shining.

2. **Gnaphalium involucratum** (Forst. Prodr. 291); caule simplici v. e basi ramosissimo, ramis strictis erectis foliatis simplicibus v. proliferis divisisque cano-tomentosis lanatisve, foliis radicalibus paucis omnibus anguste lineari-ligulatis lanceolatis spathulatisve acuminatis mucronatisve planis v. crispatis marginibus integerrimis sæpe recurvis supremis angustioribus subtus niveo-tomentosis superne glabratis, capitulis terminalibus v. ramulis brevissimis axillaribus densissime in glomerulos congestis foliis lineari-elongatis bracteatis, involucri pauciflori anguste oblongi squamis lineari-subulatis nitidis brunneis pallidisve conniventibus.—*DC. Prodr.* vi. 235; *Fl. N. Zeal.* i. 139; *Sims, Bot. Mag. t.* 2582. G. lanatum, *Forst. Prodr.* 290. G. Cunninghamii, *DC. Prodr.* vi. 235. Euchiton Forsteri *et* pulchellus, *Cass. Dict.* lvi. 216.

Hab. Common in many parts of the Island, *Gunn, etc.*—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-east and South-west Australia, New Zealand.

A very common and variable plant, easily recognized in its ordinary state by the dense round balls of capitula, surrounded at the base by spreading or deflexed, linear, leafy bracts.—*Stems* woody, and generally much branched below, annual; branches erect, 1–2 feet high, simple, divided or proliferous, bearing short, leafy ramuli in the axils of the leaves, always more or less woolly. *Leaves* numerous, radical, and on the stem, uniform throughout the plant, but the upper narrower, all petiolate, narrow, linear, linear-lanceolate or spathulate, 1–4 inches long, sharp; the margins plane or recurved, often crisped; beneath white with appressed tomentum, smooth above. *Capitula* crowded into globose masses, ½–1½ inch in diameter, which are terminal on leafless, short or elongated tops of the branches, or sessile amongst the leaves. *Involucres* very numerous, narrow; scales conniving, linear, very narrow, scarious; the outer shorter, broader, all usually brown towards the tips, rarely pale yellow-brown throughout, never spreading after the florets have fallen away, so as to expose the receptacle, which is very narrow. *Florets* few, about twelve. *Achenia* papillose or pubescent.

3. **Gnaphalium collinum** (Lab. Nov. Holl. ii. 44. t. 189); caule e basi ramoso v. simplici, ramis simplicibus erectis gracilibus molliter lanatis, foliis radicalibus petiolatis obovato-spathulatis oblongo-lanceolatisve obtusis apiculatis acutisve superne glaberrimis araneosisve subtus dense niveo-tomentosis lanatisve caulinis angustioribus acutis marginibus revolutis, capitulis in glomerulos dense congestis terminalibus v. ramulis brevibus axillaribus vix bracteolatis, involucri campanulati squamis lineari-oblongis pallidis hyalinis, floribus numerosis.—*DC. Prodr.* vi. 235; *Fl. N. Zeal.* i. 139. Euchiton collinus, *Cass. Dict.* lvi. 216.

Var. *α*; spithamæa, foliis radicalibus caulinis diversis nempe latioribus utrinque lanatis, caulibus simplicibus.

Var. *β*; omnia var. *α*, sed foliis angustioribus superne glaberrimis subtus niveo- v. argenteo-tomentosis.

Var. *γ*; pedalis et ultra, ramis ramulosis proliferisve, foliis omnibus angustioribus, glomerulis bracteolis 1–2-involucratis.—Ad *G. involucratum* accedit.

HAB. Dry pastures, etc., but not very common.—(Fl. Nov.) (*v. v.*)

DISTRIB. South-eastern Australia.

This usually presents the appearance of a very distinct species, and may always be distinguished from *G. involucratum* by the broad involucres, which have more numerous florets, and paler, broader scales; also by there being very few and short bracts below the heads, or more generally none. The common state of this plant is a tufted herb, a span high, with numerous radical, petiolate leaves, and simple, sparingly leafy, woolly stems. The var. *γ* has tall, leafy, branched stems, a foot high, and very narrow leaves, resembling very closely *G. incalveratum* in habit and appearance.—*Radical leaves* 1–3 inches long, linear-oblong or spathulate, sharp or apiculate, smooth or sparingly woolly above, densely woolly below or covered with appressed, silvery tomentum; cauline leaves narrower, sharp. *Capitula* clustered into rounded, terminal or axillary, dense masses, ¼–½ inch diameter, pale yellow-brown, shining, with one or two, generally short, leafy bracts at the base. *Involucres* 2–3 lines long, broadly oblong or campanulate, spreading after the florets have fallen away, and exposing the rather broad, many-flowered receptacle.—In the form of the involucres this plant resembles *G. luteo-album*, but the scales are less numerous, and the densely-packed inflorescence not presenting the characters of a corymb, will at once distinguish it.

4. **Gnaphalium alpigenum** (Mueller, MSS.); perenne, humile, appresse cano-tomentosum, caulibus gracilibus ascendentibus, foliis longe petiolatis elliptico-lanceolatis ellipticisve utrinque subacutis subtus densissime albo-lanatis, capitulis capitatim congestis terminalibus paucisve axillaribus, glomerulis sæpe folio albo bracteatis, involucro ut in *G. involucrato*. (*Gunn*, 120, 841.) (TAB. LXII. *A*.)

HAB. Western Mountains and Middlesex Plains, *Lawrence, Gunn*.—(Fl. Jan., Feb.)

DISTRIB. Australian Alps, elev. 6000 feet, *Mueller*.

A very pretty species, but possibly only an alpine form of *G. collinum*, from which however it appears very distinct, from its broader leaves and their longer petioles, as also from the petioled leaf beneath the head of capitula, which is not however always present. Some of Mueller's specimens are larger than any of mine, and have very broad, elliptic leaves.—PLATE LXII. *A*. Fig. 1, flower of circumference; 2, of centre:—*both magnified*.

5. **Gnaphalium indutum** (Hook. fil. in Lond. Journ. Bot. vi. 121); annuum, pumilum, gracile, laxe albido-tomentosum, caulibus e radice pluribus brevibus filiformibus ascendentibus, foliis paucis anguste linearibus flexuosis obtusis sensim dilatatis, corymbo denso (pro planta magna) polycephalo, involucri parvi squamis stramineis fuscisve basi bracteatis, acheniis subcompressis.—G. sericeum, *Turcz. in Bull. Mosc.* xxiv. 116, *fid. Sonder in Linnæa*, XXV. 521. (*Gunn*, 839.) (TAB. LXII. *B*.)

HAB. Circular Head and Georgetown, *Gunn*.—(Fl. Oct.–Dec.)

DISTRIB. South coast of Australia, from Victoria to Swan River.

A very curious, slender little species, an inch high, covered with white tomentum.—*Stems* very slender, simple, many ascending from one annual fibrous root. *Leaves* small, slender, very narrow-linear, slightly dilated upwards. *Corymbs* very large for so small a plant, dense, almost capitate, bracteate with slender, spreading leaves. *Capitula* very small, with hyaline, yellowish scales.—PLATE LXII. *B*. Fig. 1, flower of circumference; 2, of centre:—*both magnified*.

6. **Gnaphalium? Planchoni** (Hook. fil.); cæspitosum, depressum, lana molli appresso dense obtectum, ramis brevibus gracilibus dense foliosis, foliis dense imbricatis patentibus obovato-spathulatis obtusis

integerrimis utrinque lanatis, pedunculis solitariis terminalibus monocephalis, involucri squamis anguste linearibus acuminatis post anthesin reflexis extus lanatis, receptaculo plano papilloso, floribus radii 3–4-serialibus fœmineis angustissimis 4-dentatis, disci latioribus 5-dentatis hermaphroditis, antheris bicaudatis caudibus fimbriatis, acheniis oblongis sericeis. (*Gunn*, 322.) (Tab. LXII. *C.*)

Hab. Summit of Mount Olympus, *Gunn.*—(Fl. Jan.)

A remarkable little plant, quite unlike its Tasmanian congeners in habit, and more resembling some of the Arctic and Alpine European tufted species of the genus. It has the habit of, and is similar in foliage to, *Raoulia Tasmanica*, but is smaller, and has a brown or buff-coloured, woolly tomentum on the foliage and scape. The capitula too are not sessile, but peduncled, the involucral scales are very different, and the receptacle is broad and almost plane.—*Stems* tufted, short, much branched, creeping and ascending, densely leafy, 1–2 inches long. *Leaves* about $\frac{1}{5}$ inch long, spathulate, obtuse, spreading, equally woolly on both surfaces. *Peduncle* very short or $\frac{1}{2}$ inch long, slender, erect, densely woolly. *Heads* about $\frac{1}{4}$ inch long. *Involucral scales* very numerous, in about three rows, scarious or almost membranous, very narrow-linear; the outer tomentose externally. *Achenium* oblong, pubescent, silky upwards, terete. *Pappus* hairs few, slender, scabrid. (Named after my friend *M. Planchon*, who has also examined this plant, and who agrees with me in considering that, under the present limitations of the genera of Gnaphalioid *Compositæ*, this must be ranked under *Gnaphalium* itself, though, as before remarked, it differs widely from its congeners.)—Plate LXII. *C.* Fig. 1, involucre; 2, flower of circumference; 3, of centre:—*all magnified.*

Gen. XXIX. ERECHTITES, *Raff.*

Capitulum multiflorum, heterogamum, discoideum; floribus marginalibus fœmineis multi- v. pauci-seriatis, tenuissimis, 2–4-dentatis; disci hermaphroditis, 4–5-dentatis. *Receptaculum* nudum, subpapillosum. *Involucrum* cylindraceum; squamis anguste linearibus, 1-seriatis. *Styli* rami truncati v. cono superati. *Achenia* oblonga, striata, obtusa v. apice attenuata, pilosa v. scabrida. *Pappus* pluriserialis, tenuissimus, scaberulus.—Herbæ *erectæ, simplices v. ramosæ, glaberrimæ v. lanatæ.*

This genus, as defined by De Candolle, chiefly differs from *Senecio* in the extremely slender, tubular, female florets of the ray. The majority of the species are Australian and New Zealand, the rest are tropical American. About a dozen Australian species are known, several of which are common to both sides of the Continent, and four of them to New Zealand also.—Tall, smooth or woolly, simple or branched, herbaceous plants, bearing corymbs of many exceedingly narrow heads, which have no ligulate flowers. *Involucre* cylindrical; scales very long, narrow, erect, in one series, with a few short ones at the base. *Receptacle* narrow, papillose. *Flowers* of the circumference in one or many series, extremely slender, female; those of the disc broader, hermaphrodite. *Arms* of the *styles* tipped with short, hairy cones. *Achenia* oblong, striated, hairy or smooth. *Pappus* of numerous, very slender, rough hairs, in many series.—The species of *Erechtites* abound in Australia and Tasmania; a few are found in South America, and as far north as the Southern United States. (Name applied by Dioscorides to some species of *Senecio.*)

a. *Whole plant glabrous.*

1. **Erechtites prenanthoides** (DC. Prodr. vi. 296); glaberrima, caule elato robusto stricto v. flexuoso striato, foliis anguste v. late lineari-oblongis acuminatis inferioribus petiolatis caulinis semiamplexicaulibus basi dilatatis auriculatis argute eroso-dentatis, corymbis ramosis polycephalis, involucri squamis anguste linearibus glaberrimis, floribus disci 4–5-dentatis, acheniis lineari-oblongis costatis, costis puberulis apice corona callosa superatis.—*Fl. N. Zeal.* i. 141. E. sonchoides, *DC. l. c.* Senecio prenanthoides, *A. Rich. Voy. Astrol.* 96. (*Gunn*, 1175.)

Hab. Margins of streams in cool, shady places: Georgetown, Marlborough, and St. Patrick's River, *Gunn.*—(Fl. Dec., Jan.)

Distrib. South-east Australia (*DC.*); New Zealand.

Variable in size, from 1 to 3 feet high. Everywhere perfectly smooth and glabrous, except a few occasional hairs on the youngest leaves and unexpanded corymbs.—*Leaves* 3–5 inches long, membranous, linear-oblong, often very narrow, acuminate; the lower petiolate; upper sessile, expanded at the base into broad lobes, which half clasp the stem; all sharply toothed. *Corymbs* branched, very large in fully formed specimens, 6–10 inches across, of very numerous capitula, $\frac{1}{4}$ inch long. *Involucres* quite glabrous. *Achenia* linear-oblong, grooved, the ribs hairy, surmounted by a callous ring that surrounds the base of the pappus.—A New Zealand variety of this has pinnatifid leaves.

b. *Plants more or less hispid or tomentose.*

2. **Erechtites arguta** (DC. Prodr. vi. 296); tota araneo-tomentosa, caule stricto erecto simplici v. diviso, foliis anguste lineari-lanceolatis oblongisve acuminatis subtus dense albido-tomentosis superne glabratis araneosisve omnibus v. superioribus basi auriculato-bilobis grosse inæqualiter dentatis sinuatis pinnatifidisve lobis sinuato-dentatis inferioribus plerumque petiolatis, corymbis ramosis multifloris, pedicellis lanatis, involucri foliolis glabratis, floribus disci 5-dentatis, acheniis breviter oblongis sulcatis glanduloso-puberulis.—*Fl. N. Zeal.* i. 142; *Souder in Linnæa*, xxv. 524. Senecio argutus, *A. Rich. Fl. N. Zeal.* 258; *Bot. Voy. Astrol.* 104 (*non Kunth*). (*Gunn*, 408, 843.)

Var. β. *glabrata;* foliis glabratis sinuato-pinnatifidis coriaceis utrinque asperis.

Var. γ. *aspera;* foliis subcoriaceis araneosis asperisve pinnatifidis segmentis late ovatis, involucri squamis interdum purpureis.

Var. δ. *obovata;* foliis obovato-lanceolatis petiolatis sinuato-pinnatifidis superne glabris subtus araneosis, ramis foliosis, corymbis paucifloris.

Var. ε; foliis obovatis petiolatis sinuato-pinnatifidis dentatisve superne asperis subtus araneosis.

Hab. Not uncommon in waste places, etc.: Hobarton, Clarence Plains, Woolnorth, Circular Head, etc.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. South-eastern and South-western Australia; New Zealand.

A common species, varying much in size, robustness, coriaceousness of leaves, their toothing or lobing, in the upper surface being glabrous or hispid, and the lower araneose, tomentose or glabrescent. In its ordinary state it forms a tall herb, 1½–2 feet high, everywhere woolly or cobwebby, with scattered white down, branched at the top into a very many-headed corymb.—*Leaves* 3–5 inches long, narrow, linear, oblong or obovate; the lower generally contracted into a long petiole; upper (sometimes all) sessile, with a broadly two-lobed, stem-clasping base: margins unequally toothed, lobed or pinnatifid, with the lobes again toothed; upper surface nearly smooth, lower densely clothed with white wool; uppermost leaves at the axis of the corymb subulate, with broad, two-lobed, toothed bases. *Peduncles* and *pedicels* woolly. *Involucres* woolly at the very base only, similar to those of the former species. *Achenia* grooved, pubescent or papillose on the ridges.

3. **Erechtites quadridentata** (DC. Prodr. vi. 295); tota albido-lanata v. araneosa, caule erecto simplici v. ramoso, foliis angustissime lineari-elongatis acuminatis integerrimis marginibus revolutis basi simplicibus v. subauriculatis utrinque unidentatis, pedunculis pedicellisque glabratis, involucri squamis anguste linearibus, floribus disci sæpissime 4-dentatis, acheniis elongatis profunde sulcatis pubescentibus apice subattenuatis.—*Fl. N. Zeal.* i. 143. E. tenuiflora, *DC. l. c.* Senecio quadridentatus, *Lab. Nov. Holl.* ii. 48. *t.* 194. S. tenuiflorus, *Sieb. Pl. Exsicc.* 435. (*Gunn*, 1978.)

Hab. Gun-carriage Island, Bass' Straits, *Gunn.*—(Fl. Oct.)

Distrib. South-eastern and South-western Australia; New Zealand.

One of the best marked species of the genus, easily recognized by the long, narrow leaves. De Candolle

describes the achenia as rostrate, which is scarcely the case, those of my specimens being but obscurely contracted below the apex; his *E. tenuiflora* appears to me to be only a glabrous form, for the whole plant varies extremely in the amount of woolly tomentum on all its parts; and authentic specimens of *E. tenuiflora* are not altogether glabrous, as described by De Candolle, the leaves being tomentose beneath. Whole plant more or less clothed with loose, white wool, except the pedicels and involucres.—*Stems* simple or branched, 2–3 feet high. *Leaves* rather stiff, very long and narrow, 2–8 inches long, often much crowded on the stems, $\frac{1}{6}$–$\frac{1}{3}$ inch broad, sharp, margins recurved, very woolly below, cobwebby above, quite entire or with a tooth on each side at the base, where they are sessile on the stem. *Corymbs* spreading, with very slender branches. *Involucres* much larger than in any of the former species, nearly $\frac{1}{2}$ an inch long, narrow; scales very slender, green.

4. **Erechtites hispidula** (DC. Prodr. vi. 296); laxe araneoso-tomentosa v. nuda pilisque brevibus albidis hispidula, foliis radicalibus petiolatis longe oblongo- v. lineari-lanceolatis grosse irregulariter dentatis v. sinuato-pinnatifidis inferne albo-tomentosis glabratisve et concoloribus caulinis linearibus marginibus revolutis sessilibus v. basi biauriculatis, involucri basi sæpissime incrassati squamis glaberrimis, floribus disci 5-dentatis, acheniis elongatis sulcatis erostratis puberulis apice callo superatis.—*Fl. N. Zeal.* i. 142; *Sonder in Linnæa*, xxv. 524. Senecio hispidulus, *A. Rich. Sert. Astrol.* 92. *t.* 34. E. glabrescens, *DC. l. c.* (*Gunn*, 508.)

Hab. Launceston, Circular Head, etc., *Gunn.*—(Fl. Nov.)

Distrib. South-eastern and South-western Australia; New Zealand.

This is a variable species, especially as to the amount of tomentum on the foliage, stem, and corymb, and the cutting of the leaves. New Zealand specimens are much more hispid, and have the leaves more toothed, and almost pinnatifid. The capitula also vary much in size, being sometimes very narrow and slender, and at others broad, when the scales are united at the base into a fleshy, broad, obconic mass. The species approaches very near to *E. arguta*, which has usually shorter capitula. De Candolle describes the achenia of *E. glabrescens* as rostrate, but they are certainly not so, though slightly contracted below the apex.—*Stems* and leaves more or less hispid, and sometimes tomentose with lax, white wool, erect, 1–2 feet high, simple or branched from the roots or above the middle. *Leaves* 3–7 inches long, petioled, oblong or linear-lanceolate, entire, toothed or pinnatifid, hispid above, covered loosely with white tomentum or glabrous beneath; the cauline narrow-linear, sessile. *Capitula* $\frac{1}{4}$–$\frac{1}{2}$ inch long, and $\frac{1}{6}$–$\frac{1}{3}$ broad.

5. **Erechtites Gunnii** (Hook. fil. in Lond. Journ. Bot. vi. 122); laxe araneo-tomentosa, caule erecto robusto sulcato, foliis longe petiolatis anguste oblongo-lanceolatis obtusis denticulatis supra glabris subtus araneo-tomentosis, caulinis linearibus sessilibus marginibus revolutis, corymbo subcontracto, capitulis basi araneosis, involucri squamis nitidis, floribus disci 4-dentatis, acheniis anguste linearibus apice discoideis sulcatis glaberrimis. (*Gunn*, 700.) (Tab. LXIII.)

Hab. Common on the summits of the Western Mountains, elev. 3000 feet, in moist places: Arthur's Lakes, Marlborough, etc., *Lawrence, Gunn.*—(Fl. Jan., Feb.)

This appears to be a very distinct species, though in so difficult a genus it is never safe to assume that what appears very different will prove to be so if exposed to other conditions. All my specimens however from three localities are quite similar, and the glabrous achenia afford a very good character. The cobwebby wool is like that of *E. quadridentata*, and the foliage resembles that of *E. hispidula*, except that the leaves are never cut or lobed, but only minutely toothed at the margin.—*Stems* robust, 1–2 feet high, furrowed. *Leaves* 2–5 inches long, narrow, oblong-lanceolate, on long petioles, smooth and glabrous above, covered with lax, white tomentum beneath; the upper sessile, with revolute margins. *Involucres* generally black-purple, $\frac{1}{3}$ inch long. *Achenium* contracted below the apex, but not rostrate.—Plate LXIII. Fig. 1, flower of ray; 2, arm of its style; 3, flower of disc; 4, pappus; 5, corolla laid open; 6, stamen; 7, arms of style:—*all magnified.*

Gen. XXX. SENECIO, *L.*

Omnia *Erechtitis*, sed capitula homogama, plerumque radiata, floribus radii disco conformibus v. ligulatis. *Involucri* squamæ lineari-oblongæ, plerumque apicibus sphacelatis, discoloribus. *Styli* fl. hermaphroditorum apice truncatis pilosis. *Achenium* teretiusculum v. sulcatum.—Herbæ, frutices, v. arbusculæ; foliis *alternis*.

One of the largest genera of plants, found in all parts of the globe, the species of which are invariably extremely difficult of discrimination, not only the specific characters being liable to great variation, but the sectional ones also, which are drawn from the involucral scales, discoid or radiate capitula, scabrous, smooth, or echinate pappus, form of the achenium, etc. Numbers of small groups have been proposed, but these all run into one another, individual species often oscillating between several of them. About twenty Australian species of the genus are known, the many more which are enumerated being synonyms and varieties: all of them are extratropical, and the majority natives of the South-eastern quarter of the continent. In variety and beauty the Australian species are far inferior to the New Zealand ones.—Herbs, bushes, or small trees, with alternate, simple or much divided leaves. *Capitula* yellow, many-flowered. *Flowers* of the circumference female, ligulate or like those of the disc; those of the disc tubular, campanulate above, hermaphrodite, five-cleft; anthers exserted. *Arms of the styles* of the disc-flowers truncated, downy at the tip only; those of the ligulate florets linear, rounded, blunt, smooth. *Involucre* broadly hemispherical or oblong, of one series of long, green, herbaceous scales, usually brown at the tips, as long as the disc, and with a few much smaller scales at their base. *Receptacle* convex, papillose. *Achenia* smooth or hairy, often ribbed. *Pappus* of two or more series of soft, slender, roughened or rigid and scabrous, usually snow-white hairs. (Name from *senex*, an old man: in allusion to the white, hairy pappus.)

a. *Herbs, glabrous or nearly so, with simple or branched, leafy stems, and corymbose capitula.*

1. **Senecio lautus** (Forst. Prodr. 538); glaberrimus, herbaceus, caule brevusculo simplici v. ramoso flexuoso sulcato, foliis carnosis polymorphis omnibus v. inferioribus solum petiolatis lineari-oblongis spathulatisve acutis sinuato-dentatis superioribus v. sæpissime omnibus lineari-oblongis sinuatis lobatis pinnatifidisve lobulis brevibus elongatisve integerrimis v. repando-dentatis, petiolis basi simplicibus v. semiamplexicaulibus, corymbis oligo-(3–7)-cephalis, involucri late campanulati squamis linearibus acuminatis basi squamulis paucis sæpius subsquarrosis involucratis, ligulis brevibus elongatisve rarius 0, acheniis linearibus sulcatis costis pubescentibus.—*Fl. N. Zeal.* i. 145. S. rupicola, *A. Rich. Voy. Astrol.* 119. *t.* 37; *DC. l. c.* S. carnulentus, *DC. l. c.* S. pinnatifolius, *A. Rich. Voy. Astrol.* 117. S. crithmifolius, *A. Rich. Voy. Astrol.* 116. S. neglectus, *A. Rich. Fl. N. Zeal.* 258. (*Gunn*, 106, 434.)

Variat insigniter, statura ¼–2-pedalis; caule gracili v. robusto, simplici v. e basi ramoso, superne glaberrimo v. parce tomentoso; foliis brevibus elongatisve, integris lobatis pinnatifidis v. subbipinnatifidis, segmentis valde irregularibus; capitulis magnis parvisve; radii ligulis latis angustisve, elongatis brevibusve; acheniis pubescentibus glabratisve.

Hab. Abundant, especially everywhere on the coasts.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. South-eastern and South-western Australia; New Zealand.

Authentic specimens of Forster's *S. lautus*, of Labillardière's *S. linifolius*, and an examination of A. Richard's specimens of the species included as synonyms under this, enable me to refer them all, without hesitation, to one common and variable species. The whole plant often becomes very succulent when exposed to the spray of the sea.—Herbaceous, everywhere quite glabrous. *Stems* 6–24 inches high, erect, simple or branched, furrowed. *Leaves* rather fleshy, the lower spathulate, the upper toothed or serrated or laciniate or pinnatifid, sometimes all pinnatifid, the lobes entire or toothed; petioles simple or expanding at the base into semiamplexicaul lobes.

Capitula yellow, corymbose, calyculate at the base, broadly campanulate, discoid or radiate. *Achenia* linear, furrowed, with glabrous or pubescent ridges.

2. **Senecio capillifolius** (Hook. fil. in Lond. Journ. Bot. vi. 123); radiatus, herbaceus?, ramosus, glaberrimus, caule striato folioso, foliis sessilibus in laciniis distantibus perplurimis filiformibus divisis, laciniis elongatis basi remotis angustissimis bis terve divisis lobulatisve, capitulis corymbosis late turbinatis pedicellisque subglandulosis, floribus radii paucis, involucri squamis disco brevioribus basi bracteolatis marginibus acheniisque puberulis. (*Gunn*, 705.) (Tab. LXIV. *A*.)

Hab. Tasmania, *Gunn*.

I have only one specimen of this very distinct-looking species, which resembles *S. anethifolius*, A. Cunn., very closely in foliage, but has a broader capitulum, with long, spreading rays; it may be recognized at once by the leaves being pinnatisect, and the lobes again divided into filiform laciniæ.—Plate LXIV. *A*. Fig. 1, capitulum; 2, flower of ray; 3, arms of its style; 4, flower of disc; 5, hair of pappus; 6, stamen; 7, arms of style:—*all magnified*.

3. **Senecio pectinatus** (DC. Prodr. vi. 372); herbaceus, subscapigerus, glaberrimus, caule basi decumbente, ramis scapisve simplicibus erectis 1-cephalis (rarius 2–3-cephalis), foliis anguste linearibus lanceolatis subspathulatisve integris obtuse dentatis sinuato-dentatisve marginibus recurvis, caulinis paucis erectis linearibus, involucro subcampanulato calyculato, capitulo magno, ligulis 12–20, acheniis glabris. (*Gunn*, 107, 1047.)

Hab. Mount Wellington, *Gunn*.—(Fl. Jan.)

Distrib. Victoria: Cobboras Mountains, elev. 6000 feet, *Mueller*.

A very distinct species.—*Stems* short, procumbent, often tufted, leafy. *Branches* resembling scapes, ascending or erect, leafy below. *Leaves* 1–3 inches long, extremely variable in shape, linear or lanceolate or narrow oblong-spathulate, obscurely toothed or deeply lobed, and almost pinnatifid, breadth $\frac{1}{8}$–$\frac{1}{3}$ inch, margins recurved. *Scapes* or flower-branches with erect, linear leaves. *Capitula* large, solitary, terminal, $\frac{1}{2}$–$1\frac{1}{2}$ inch broad, deep yellow. *Involucre* campanulate. *Rays* large, broad, spreading, and revolute.—Dr. Mueller's specimens have deeply pinnatifid leaves and very large capitula.

4. **Senecio leptocarpus** (DC. Prodr. vi. 372); herba glaberrima subscapigera, caule simplici apice corymboso oligocephalo, foliis anguste lineari-oblongo-lanceolatis spathulatis v. late linearibus obtuse sinuato-dentatis pinnatifidisve, caulinis paucis subsimilibus, involucro campanulato calyculato, ligulis 10–15 elongatis, acheniis linearibus glaberrimis infra apicem contractis. (*Gunn*, 268.) (Tab. LXIV. *B*.)

Hab. Mount Wellington, *Gunn*; Mount Sorrell, Macquarrie Harbour, elev. 3000 feet, *Milligan*.—(Fl. March.)

This resembles *S. pectinatus* very much indeed in habit, size, and foliage (the latter in both being extremely variable), but has terminal corymbs of six to eight heads, with much longer rays.—Plate LXIV. *B*. Fig. 1, flower of ray; 2, arms of its styles; 3, flower of disc; 4, pappus; 5, stamen; 6, arms of style:—*all magnified*.

b. *Glabrous, branched undershrubs. Flowers of the ray ligulate.*

5. **Senecio spathulatus** (A. Rich. in Voy. Astrol. 125); glaberrimus, suffruticosus, ramosus, ramis nitidis foliosis, foliis sessilibus obovato-oblongis obtusis subspathulatisve grosse argute dentatis basi sessilibus auriculatis, capitulis terminalibus pedunculatis, involucri bracteolati squamis apice subciliatis marginibus late membranaceis, ligulis elongatis, acheniis glaberrimis sulcatis radii elongatis.—*DC. Prodr.* vi. 373. (*Gunn*, 844.)

Hab. D'Entrecasteaux Channel, *Lesson*; Woolnorth, near the sea, *Gunn*.—(Fl. March.)

Distrib. South-eastern Australia: New South Wales and Victoria.

A remarkably distinct and handsome species, my Tasmanian specimens of which have a short and woody stem at the very base only, whilst the Australian ones form a small undershrub.—Everywhere perfectly glabrous, branched. *Branches* shining, leafy. *Leaves* about an inch long, sessile, auricled at the base, oblong-obovate or subspathulate, more or less toothed, blunt. *Capitula* large, peduncled, solitary or two or three in a corymb, 1 inch across, with long, yellow rays. *Involucral scales* with broad, membranous borders. *Pappus* very white, shining. *Achenia* glabrous, sulcate, linear, those of the ray much the longest.

6. **Senecio velleioides** (A. Cunn. in DC. Prodr. vi. 374); herbaceus, glaberrimus, caule erecto tereti apice ramoso, foliis obovato- v. oblongo-lanceolatis subpanduriformibus acutis basi profunde bilobis auriculatis dentatis superioribus cordatis integerrimis, capitulis corymbosis, involucris fere ebracteolatis, ligulis elongatis, acheniis sulcatis glabris puberulisve. (*Gunn*, 1176.)

Hab. Damp, shaded, alpine parts of the Colony, growing in very rich soil, as Mount Fatigue, Lake St. Clair, elev. 2–4000 feet, *Lawrence, Gunn, Milligan.*

Distrib. South-eastern Australia: Victoria and New South Wales.

A very handsome species, everywhere perfectly glabrous. *Stems* erect, 1–3 feet high, simple or sparingly branched, bearing a large corymb of capitula. *Leaves* 1–4 inches long, linear-oblong or lanceolate-oblong, contracted towards the base, which clasps the stem with two large auricles, acute, sharply toothed, the upper ones shorter, nearly entire. *Capitula* with long, yellow rays.

7. **Senecio australis** (Willd. Sp. Pl. iii. 1981); glaberrimus v. foliis subtus cano-tomentosis, herbaceus, erectus, caule simplici v. ramoso, foliis anguste lineari-lanceolatis acuminatis marginibus revolutis integerrimis v. basi dentatis v. pinnatifidis auriculatis, capitulis corymbosis radiatis, involucris calyculatis angustis floribus brevioribus, ligulis parvis, acheniis puberulis.—*DC. Prodr.* vi. 374; *A. Rich. Voy. Astrol.* 131. *t.* 39. S. dryadeus, *Sieb. Pl. Exsicc.* 337. (*Gunn*, 114, 842.)

Hab. Common throughout the Colony in waste places, etc., *Lawrence, Gunn, etc.*—(Fl. Oct.–Jan.) (*v. v.*)

Distrib. South-eastern Australia: New South Wales and Victoria.

A tall, slender, simple or sparingly branched herb, generally perfectly glabrous, except the under surface of the leaves, which are often covered with white tomentum. De Candolle says that it is a native of New Zealand; but I have seen no specimens from that country, and suspect some mistake.—*Stems* 1–3 feet high, branching out into large corymbs at the top. *Leaves* 2–6 inches long, narrow linear-lanceolate, spreading, acuminate, coriaceous, margins more or less recurved or revolute, sessile, the margins at the base rarely quite entire, generally deeply toothed or pinnatifid, with one or two long, narrow, patent, linear laciniæ. *Capitula* numerous, rather small, about $\frac{1}{3}$ inch long. *Involucre* shorter than the flowers. *Rays* short.—De Candolle describes the achenia as glabrous, but they are puberulous in my specimens.

§ 3. *Simple or branching herbs. Flowers of the ray without ligulæ, or with very small ones.*

8. **Senecio odoratus** (Hornemann, Act. Hafn. ii. 809); herbaceus, erectus, ramosus, ramis sulcatis, foliis oblongo-lanceolatis lineari-oblongisve basi contracta aurito-semiamplexicaulibus grosse argute irregulariter dentatis acutis rugosis subtus laxe albo-tomentosis glabratisve, capitulis dense corymbosis parvis, involucro cylindraceo calyculato floribus breviore, radiis nullis, acheniis puberulis.—*DC. Prodr.* vi. 371; *Rich. Flor. Astrol.* 109; *Sonder in Linnæa*, xxv. 525. S. otiphyllus, *A. Cunn. MSS.* Cacalia odorata, *Desf. Hort. Par.* 165 *et* 400. (*Gunn*, 435.)

Hab. Woolnorth, *Gunn*; Macquarrie Harbour, *A. Cunningham.*—(Fl. Feb.)

Distrib. South-eastern Australia: Victoria.

An erect, branching, herbaceous species, 2–3 feet high, with deeply grooved, glabrous stem and branches.

Leaves coriaceous, 1–2 inches long, similar in form to those of *S. velleioides*, but with narrower bases, more deeply and irregularly toothed margins, and with the under surface covered at times with a scanty lax white tomentum. *Capitula* numerous, densely corymbose, without rays, small. *Involucres* linear, half the length of the florets, their scales sometimes united at the base into an obconic, fleshy, hard receptacle.

9. **Senecio Georgianus** (DC. Prodr. vi. 371); herbaceus, cano- v. araneo-tomentosus glabratusve, foliis coriaceis linearibus anguste lineari-lanceolatisve subacutis utrinque cano-tomentosis glaberrimisve margine revolutis integerrimis, corymbo laxiusculo composito ramis ad axillos bracteatis, involucris calyculatis floribus brevioribus ovato-cylindraceis, ligulis nullis, acheniis sericeis.—*Sonder in Linnæa*, xxv. 525. Erechtites candicans, *Nob. in Lond. Journ. Bot.* vi. 122. (*Gunn*, 701.)

Hab. Tasmania, *Gunn*.

Distrib. South-eastern and South-western Australia: from subtropical New South Wales, Victoria, Adelaide, and Swan River.

I have only one Tasmanian specimen of this very distinct species, but a great number of Australian ones (collected by Cunningham, Mueller, Drummond, Robertson, and others), from a comparison of which it appears to be a very variable plant, being either perfectly glabrous or more or less covered (even on the involucre) with a hoary tomentum; the leaves also are perfectly entire or deeply sinuate and toothed or irregularly toothed and lobed along the margin. De Candolle's description of *A. Cunninghamii* accords with the glabrous states of this.—An erect, herbaceous species, 1½–3 feet high. *Stems* simple or branched. *Leaves* 2–4 inches long, narrow-lanceolate, quite entire in the Tasmanian specimen, with revolute margins, coriaceous. *Involucres* linear-oblong, cylindrical, shorter than the flowers. *Ray* none. *Achenia* silky.

Gen. XXXI. BEDFORDIA, *DC.*

Capitulum multiflorum, homogamum; floribus omnibus tubulosis, hermaphroditis. *Receptaculum* favosum, alveolorum marginibus dentatis. *Involucri* ovati squamis 1-serialibus, basi calyculatis. *Corollæ* tubus basi gracilis, abrupte ampliatus; antheris semiexsertis basi ecaudatis. *Achenia* glabra. *Pappi* setæ basi scaberulæ, apices versus barbellatæ.—Frutices; ramis *tomentosis;* foliis *alternis, subtus tomentosis:* capitulis ***magnis, in corymbos axillares oligocephalos aggregatis subsolitariisve.***

I have in the 'New Zealand Flora' (vol. i. pp. 147, 149) suggested the necessity of reducing this genus to *Senecio*, to which it is united by means of the species belonging to Forster's genus *Brachyglottis;* but as the intermediate forms are wanting in Australia, I have thought it more convenient to retain the genus for the present, its habit being very distinct from any of the Senecios of that country. The two Tasmanian species are the only ones known. These may best be distinguished from the other Australian *Senecionideæ* by the shrubby habit, more deeply pitted receptacle, the broader upper part of the tube of the corolla, the half-exserted stamens, and the pappus hairs being more scabrous below, and more plumose towards the tip.—Both are shrubs, with alternate leaves, beneath tomentose, as are the branches, and large capitula, which are axillary, solitary or few together, and with no ray flowers. *Involucral scales* in one series (De Candolle describes them as being in two or three series), not sphacelate or brown at the tips. (Named in honour of the late *Duke of Bedford*, an eminent and liberal patron of Horticulture and Botany.)

1. **Bedfordia salicina** (DC. Prodr. vi. 441); frutex, ramis tomentosis, foliis breve petiolatis planis anguste lineari-lanceolatis lineari-oblongisve rugosis integerrimis subtus reticulatim venosis cinereo-tomentosis, corymbis axillaribus folio brevioribus oligocephalis.—Cacalia salicina, *Lab. Nov. Holl.* ii. 37. *t.* 179; *Lindl. Bot. Reg.* 923. Culcitium salicinum, *Spreng. Syst. Veg.* iii. 431. (*Gunn*, 121.)

Hab. Common on the skirts of forests and in the brush.—(Fl. Oct.–Dec.) (*v. v.*) (Cultivated in England.)

This is one of the very few common Tasmanian plants that are not found in Australia.—A bush 8–14 feet high. *Leaves* petioled, 3–10 inches long, flat, lanceolate or oblong or linear-lanceolate, blunt, reticulated and glabrous above, covered beneath with fuscous tomentum. *Capitula* in short, axillary corymbs.

2. **Bedfordia linearis** (DC. Prodr. vi. 441); fruticulus robustus, foliis brevissime petiolatis confertis anguste linearibus obtusis margine revolutis subtus tomentosis, capitulis axillaribus pedunculatis subsessilibus.—Cacalia linearis, *Lab. Nov. Holl.* ii. 36. *t.* 178. Culcitium lineare, *Sprang. Syst.* iii. 431 (*Gunn*, 166.)

Hab. Common, especially in the central mountainous and southern parts of the Island, in rocky soil —(Fl. Oct.–Dec.) (*v. v.*)

A small, robust, branching shrub, 1–5 feet high; branches glabrous, younger ones densely tomentose. *Leaves* very variable in breadth, usually narrow-linear, almost sessile, 1–3 inches long, blunt, glabrous above, tomentose beneath, margins revolute. *Capitula* very tomentose, $\frac{1}{3}$ inch long, shortly peduncled, axillary, solitary or rarely two together.

Gen. XXXII. CENTROPAPPUS, *Hook. fil.*

Capitulum multiflorum, heterogamum, radiatum; *floribus radii* paucis, 1-seriatis, fœmineis, ligulatis; *ligula* lata, 9-nervi; *disci* tubulosis, superne campanulatis, 5-dentatis. *Receptaculum* planiusculum, alveolatum. *Involucri* squamæ 1-seriales, coriaceæ, lineari-oblongæ. *Antheræ* exsertæ, ecaudatæ. *Styli rami* elongati, apice penicillati. *Pappi* setæ 1-seriatæ, flexuosæ, superne subspinuloso-barbellatæ. *Achenium* lineari-oblongum.—Arbuscula *subalpina, glaberrima;* ramulis *grosse cicatricatis, teretibus;* foliis *versis apices ramulorum alternis, patulis, linearibus, sessilibus, integerrimis, 1-nerviis;* capitulis *corymbosis, terminalibus, flavis.*

1. **Centropappus Brunonis** (Nob. in Lond. Journ. Bot. vi. 124). (*Gunn*, 1174.) (Tab. LXV.)

Hab. Above the upper limits of the forest on Mount Wellington, elev. 3500–4000 feet. (*Gunn*, 1174.)—(Fl. Jan.)

This again is quite an artificial genus, differing from *Bedfordia* chiefly, or only, in the ligulate female flowers, and from the Tasmanian species of *Senecio* in habit, in the exserted anthers, and in the pappus, which is rough with prominent, rigid, spinulose setæ.—A small tree or large shrub, everywhere quite glabrous, 7–10 feet high, with few naked branches and terete branchlets, covered with the transverse scars left by the petioles of the fallen leaves. *Leaves* sessile at the end of the branchlets, 3–4 inches long, about $\frac{1}{2}$–$\frac{1}{3}$ inch broad, somewhat coriaceous, linear, blunt, one-nerved, quite entire, and glabrous. *Corymbs* terminal. *Capitula* shortly pedicelled, $\frac{1}{3}$ inch long, rather broad. *Involucral scales* bracteolate at the base, in one series, rigid, coriaceous, erect, fimbriate or ciliate at the edges, somewhat viscid, shorter than the disc flowers. *Receptacle* flat, pitted. *Flowers* of ray with broad, nine-nerved ligulæ; of the disc tubular, broadly campanulate, with exserted anthers. *Achenia* quite smooth and glabrous, linear-oblong. *Pappus hairs* rigid and stout, of elongated, rigid cells, produced laterally into horn-like processes, dirty white coloured.—Plate LXV. Fig. 1, capitulum: 2, scale of involucre; 3, flower of ray; 4, its pappus: 5, arms of its style; 6, flower of disc: 7, hair of its pappus: 8, arms of its style:—*all magnified.*

Tribe III. Cynareæ.

Gen. XXXIII. CYMBONOTUS, *Cass.*

Capitulum multiflorum, heterogamum, radiatum; *floribus radii* 1-seriatis, numerosis, ligulatis, fœmineis; *disci* tubulosis, hermaphroditis, 5-dentatis. *Receptaculum* alveolatum, alveolis margine subfimbrilli-

feris. *Involucrum* hemisphæricum; squamis imbricatis, multiseriatis. *Staminum* filamenta lævia. *Achenium* calvum, glabrum, dorso bi-alatum, alis inflexis, margine subcrenatis.—Herbæ *acaules, scapigeræ;* foliis *radicalibus, petiolatis, subspathulatis, subtus albo-lanatis;* scapis 1-*cephalis;* capitulis *flavis.*

1. **Cymbonotus Lawsonianus** (Cass. Dict. xxxv. 397).—*Gaud. in Freyc. Voy. Bot.* 462, *t.* 86; *DC. Prodr.* v. 491. C. Preissianus, *Steetz, Plant. Preiss.* i. 486. (*Gunn,* 509.)

Hab. Abundant throughout the Island.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern and South-western Australia.

A very common and variable plant, easily recognized by its bright yellow heads, which, appearing early in spring, at a distance recalls the English Primrose to mind. Sonder has reduced the *C. Preissianus* to *C. Lawsonianus*, and I have also failed to find any character whereby to distinguish the Swan River individuals from the Tasmanian. The genus is remarkable as being almost the only one of the tribe to which it belongs which inhabits Australia, and for being most closely allied to the Cape genera *Arctotis* and *Venidium.*—A small, stemless herb, with numerous spreading leaves, white beneath, and heads borne on short scapes. *Roots* of many thick, fleshy fibres. *Leaves* 3–5 inches long, spathulate, ovate, elliptical or oblong, coarsely toothed, lobed or runcinate-pinnatifid, with the lobes denticulate; upper surface pubescent or glabrous; under thickly covered with appressed white down; petioles often tomentose. *Scapes* very short, tomentose. *Heads* $\frac{1}{3}$–1 inch across. *Involucre* hemispherical, of several rows of tomentose scales, sometimes black at the tips. *Receptacle* alveolate. *Flowers of ray* in one series, ligulate, female; of the disc tubular, five-toothed. *Pappus* none. *Achenia* with two dorsal wings. (Name from κυμβος, *a hollow*, and νωτος, *the bark;* in allusion to the form of the achenium.)

Tribe IV. Ligulifloræ.

Gen. XXXIV. MICROSERIS, *Don.*

Capitulum multiflorum; floribus omnibus hermaphroditis, ligulatis. *Involucrum* anguste campanulatum; squamis linearibus, 1-seriatis, basi bracteolatis. *Receptaculum* nudum, alveolatum. *Achenium* lineare, erostre, striatum, glaberrimum. *Pappus* 1-serialis, subpaleaceus, paleis glaberrimis, basi dilatatis, superne in setam rigidam scaberulam productis.—Herbæ *glabræ, acaules;* foliis *anguste-linearibus;* scapis 1-*cephalis;* capitulis *flavis.*

1. **Microseris Forsteri** (Fl. N. Zeal. i. 151); foliis anguste linearibus integerrimis sinuato-dentatis pinnatifidisve lobis elongatis, pappi setis basi solum anguste paleaceis.—M. pygmæa, *Raoul, Choix de Plantes de la Nouvelle Zélande, p.* 45, *non Hook. et Arn.* Phyllopappus lanceolatus, *Walpers in Linnæa,* xiv. 507; *Sonder, ibid.* xxv. 529. Scorzonera scapigera, *Forst. Prodr.* 534. Monermos Lawrencii, *Nob. in Lond. Journ. Bot.* vi. 224. (*Gunn,* 506.) (Tab. LXVI.)

Hab. Abundant in good soil in many parts of the Island, *Lawrence, Gunn, etc.*—(Fl. November.) (*v. v.*)

Distrib. South-eastern and South-western Australia; New Zealand.

There are only two known species of this genus, the present and a very closely allied Chilian plant, which differs in the broader paleæ of the pappus. It is everywhere an extremely variable plant, sometimes being nearly two feet high, with leaves almost an inch broad, and varying from being perfectly entire to deeply pinnatifid.—A stemless herb, with milky juice, narrow, flaccid leaves, and solitary, yellow heads on slender scapes. *Roots* of many fleshy fibres, eaten by the natives of Port Phillip, etc. (*Gunn*). *Leaves* 1–6 inches long, linear, quite entire, toothed or pinnatifid, very irregularly cut. *Scapes* longer or shorter than the leaves, often downy above. *Heads* $\frac{1}{3}$–$\frac{2}{3}$ inch long. *Involucre* narrow, campanulate, of one series of linear, erect, fleshy scales, with membranous borders, surrounded at the base by two series of much smaller, ovate, acuminate scales. *Florets* all ligulate, yellow, with nar-

row, spreading ligulæ and short tubes. *Achenia* linear, quite smooth *Pappus* pale yellow-brown, of one series of slender, smooth bristles, expanding below and becoming paleaceous. *Receptacle* smooth, glabrous, pitted. This plant is common to Tasmania and South Australia, varying extremely in both countries, sometimes attaining a height of nearly two feet, with leaves as broad as the finger; these vary in amount of lobing, being entire or pinnatifid, with long, narrow, spreading segments an inch long. (Name from *μικρος, small*, and *σερις, a lettuce.*)—PLATE LXVI. Fig. 1, receptacle and portion of involucre; 2, flower; 3, stamen; 4, arms of style; 5, achenia—*all magnified.*

Gen. XXXV. PICRIS, *L.*

Capitulum multiflorum; flosculis omnibus ligulatis. *Involucri* squamæ imbricatæ, exteriores patulæ. *Receptaculum* nudum. *Achenium* sulcatum, jugis apice transverse rugosis. *Pappus* 1–2-serialis; pilis plumosis.—Herbæ *erectæ, scaberulæ v. pilosæ*; foliis *alternis*; capitulis *subcorymbosis, flavis.*

Tall, erect, leafy herbs, with milky juice, of which one European species also inhabits various parts of India, Australia, Tasmania, and New Zealand, varying considerably, especially in hairiness, in all places, being sometimes nearly smooth, at others very hispid, with stiff, spreading bristles. *Stems* 2–4 feet high. *Radical leaves* petiolate, linear-oblong, blunt, more or less sinuate, toothed and hispid; cauline smaller, sessile, linear, acuminate. *Panicle* loosely branched. *Peduncles* long and slender, often quite smooth. *Pedicels* bracteolate. *Involucres* ½–⅔ inch long, campanulate; *scales* in two to three series, hispid and pubescent; the outer shorter, often recurved; inner long, forming one row, acuminate. *Flowers* all ligulate, yellow; *rays* spreading. *Pappus* of one series of fine white, feathery, soft hairs. *Achenia* contracted above, turgid below, furrowed, the ridges tuberculate.—The other species of this genus are chiefly natives of the South of Europe. (Name from *πικρος, bitter*, as is the juice of this and many others of the tribe.)

1. **Picris hieracioides** (Linn. Sp. Pl. 1115); pilus minusve hispido-pilosa, foliis petiolatis oblongo-lanceolatis sinuatis dentatisve caulinis basi semiamplexicaulibus, capitulis corymbosis, acheniis superne constrictis striatis transverse rugulosis.—*DC. Prodr.* vii. 128. P. attenuata, *A. Cunn. in Ann. Nat. Hist.* ii. 125. P. angustifolia, *DC. Prodr.* vii. 130; *Sonder in Linnæa*, xxv. 529. P. barbarorum, *Lindl. in Ann. Sc. Nat. Ser.* 2. xv. 63. P. squarrosa, *Steetz, in Plant. Preiss.* i. 488; *Sonder, l. c.* P. asperrima, *Lindl. in Bot. Reg.* 1838, *No.* 108. (*Gunn*, 115.)

HAB. Common in the northern parts of the Island, *Gunn, etc.*—(Fl. Nov., Dec.) (*v. v.*)

DISTRIB. South-eastern and South-western Australia; New Zealand; Temperate Europe and Asia.

Gen. XXXVI. SONCHUS, *L.*

Capitulum multiflorum; floribus omnibus hermaphroditis, ligulatis. *Involucri* squamæ imbricatæ, multi- v. pauci-seriatæ. *Receptaculum* nudum. *Achenia* omnia conformia, compressa v. alata, costata, erostria, lævia v. tuberculata. *Pappus* mollis, pluriserialis, pilis tenuissimis albis.—Herbæ *plerœque elatæ*; caulibus *spongiosis fistulosisve*; foliis *alternis*; capitulis *flavis purpureisve.*

1. **Sonchus asper** (Fuchs, Hist. 674).—S. fallax, *Wallroth*; *DC. Prodr.* vii. 185. S. oleraceus, *γ et δ, Linn. Sp. Pl.* 1117. S. oleraceus, *β*, asper, *DC. Fl. Franc.* 2895.

Var. *β. megalocarpa*; acheniis crassis late alatis compressis disco sulcatis costis 3–5 spongiosis. (*Gunn*, 845.)

HAB. Var. *β. megalocarpa*, common, but only near the sea on the north shore of the Island, *Gunn.*—(Fl. Dec.–Feb.)

The subject of the Southern *Sonchi* allied to the European *S. oleraceus, asper* and *arvensis*, is involved in much

obscurity, partly owing to these species having been early imported into all the temperate quarters of the globe and becoming speedily naturalized; partly to their being truly indigenous in some of the south-temperate parts of the globe, to which they have also been imported by man; and most of all to the differences of opinion that exist as to what are species and what varieties amongst them, and which are enhanced greatly in the case of dried specimens. Thus in New Zealand the two forms or species, *Sonchus oleraceus* and *S. asper*, are both native, and the *S. oleraceus* has also been imported from Europe; and it is a curious fact, that the natives who used to eat the wild form of the plant have latterly given up its use, preferring the introduced. It still however remains to be proved whether the wild New Zealand species does not attach itself to cultivated places, and hence may not on some occasions be assumed to be introduced. These are points requiring the greatest care in investigation, and that observations should be made at many remote parts of the Colony. In Tasmania only one native form of *Sonchus* appears, differing from both *S. oleraceus* and *S. asper* in the form, etc., of the achenium, an organ which is so variable in the genus that I hesitate to found a new species upon its Tasmanian modification. The *S. asper* itself, and the European form of *S. oleraceus*, are also found both in South-east and South-west Australia, but whether indigenous or introduced I cannot say. Mr. Mueller distinguishes two at Victoria as *S. oleraceus* and *S. asper*, and says that though I have united these species in the 'New Zealand Flora,' the Victoria specimens are perfectly distinct, and that besides the constant differences in their fruit, they differ in the shape and size of the leaves, and in the internal structure of the stem. These characters are however not so constant as Mr. Mueller supposes, the fruit especially being extremely variable, and presenting many intermediate modifications; whilst the stems and foliage present great diversities of size, form, consistence, and internal structure in very many of the species of Liguliflorous *Compositæ*. If such common plants as *Sonchus asper* and *oleraceus* were really always distinguishable, it must have been proved long ago, and botanists would not have required a century to make up their minds about them; whereas from the days of Linnæus to the present opinions are divided upon the subject. It appears to me to be a matter of little importance whether we call such varying, closely allied forms, species or varieties, so long as they are properly discriminated. Only one other *Sonchus* has been found in Australia, near Port Macquarrie, of which I have seen an indifferent specimen.—The Tasmanian *Sonchus* is a tall, smooth, branching or simple, leafy, succulent, milky herb, with a hollow (?) grooved stem, and subumbellate corymbs of yellow heads; it varies extremely in size and habit, from 6 inches to 2 feet high, and in the form and cutting of the foliage. *Leaves* ovate-oblong or linear-oblong, petiolate or sessile, entire, sinuate and irregularly toothed, or runcinate-pinnatifid, with large or small toothed lobes, sometimes quite linear-elongated and sessile and acuminate, with waved spinulose margins, in others broadly oblong, deltoid, or fiddle-shaped, with a long winged petiole; *cauline* leaves clasping the stem, with broad auricles. *Involucral scales* in several series. *Heads* yellow, $\frac{2}{3}$–$1\frac{1}{3}$ inch across, of many ligulate florets. *Receptacle* smooth. *Pappus* of many series of simple, white, soft hairs. *Achenium* oblong, blunt at both ends, compressed, broadly winged, the disc grooved and ribbed. (Name from σομφος, *hollow*, in allusion to the hollow stems; σογχος in Greek.)

Additional Observations on the Tasmanian Compositæ.

Eurybia *capitellata* (DC. Prodr. v. 266).—This is mentioned by Sonder (Linnæa, xxv. 456) as having been found in Tasmania by Stuart. According to De Candolle it differs from *E. axillaris* in the pedicelled capitula.

Eurybia *ciliata* (Benth.; *see* Sonder in Linnæa, xxv. 458).

Eurybia *Gunniana* (DC.). Sonder (Linnæa, xxv. 460) has well discussed the question of the value of the double and single pappus of *Olearia* and *Eurybia*, and has further reduced *E. quercifolia*, Cass., and *Olearia phlogopappa*, DC. (*Aster phlogopappus*, Lab.), to *E. Gunniana*; that able author has also reduced *Aster stellulatus*, Lab., to *E. fulvida*, Cass., and suggested its being a variety of *E. Gunniana*.

Eurybia *linifolia* is referred by Sonder to Lindley's *E. glutinosa* (Bot. Reg. N. S. xii. Misc. 68), and is said to differ from *E. glutescens* (Sonder, Linnæa, l. c.) in the striated, not angled, branches, narrower, shorter, not sca-

brid leaves, corymbs much longer than the leaves, and pubescent, eglandular achenia. I find however that these characters are insufficient to distinguish the two, as my description of the Tasmanian plant shows.

EURYBIA *ericoides* (p. 180).—This, according to Sonder, is not the plant of Steetz, but is a new species described by the former author as ***E. Hookeri.***

EURYBIA *scabra* (Benth. En. Pl. Hügel.; Sonder, in Linnæa, xxv. 457) is described as a Tasmanian species, found by Bauer, and preserved in the Vienna Herbarium, but I have seen no specimens.

EURYBIOPSIS *scabrida* and *E. gracilis* (*see* pp. 181, 182), under *Vittadinia scabra* and *cuneata*, are both referred by Sonder to forms of *Eurybiopsis Hookeri*, Muell. MSS., along with *Eurybia cuneifolia* (Walpers in Linnæa, xiv. 316), *Aster Behrii* (Schldl. in Linnæa, xxi. 446).

BRACHYCOME *pumila*, Walp. (p. 186), is referred by Sonder to *Lagenophora latifolia*, H.f.

COTULA *australis*, H.f. (p. 191), add to the synonyms *Pleiogyne australis*, Carl Koch. in Schldl. and Mohl. Bot. Zeit. i. 40; Sonder, in Linnæa, xxv. 484.

LEPTINELLA *longipes*, H.f. (p. 193), is *Pleiogyne reptans*, C. Koch, l. c., and *Strongylosperma reptans*, Benth En. Pl. Hüg. 60, according to Sonder.

LEPTINELLA *intricata*, var. *β. multifida*, H.f. (p. 194).—This is *Pleiogyne multifida*, Sonder in Linnæa, l. c.

RAOULIA *catipes*, *for* Tab. LXI. *A.*, *read* LVIII. *A.*

PTERYGOPAPPUS *Lawrencii*, *for* Tab. LXI. *B.*, *read* LVIII. *B.*

NAT. ORD. XLIII. BRUNONIACEÆ.

Gen. I. BRUNONIA, *Sm.*

Capitulum involucratum. *Calyx* 5-fidus, 4-bracteatus, laciniis plumosis. *Corolla* monopetala, infundibuliformis; limbo 5-partito, laciniis 2 superioribus altius divisis. *Stamina* 5, hypogyna. *Antheræ* connatæ. *Ovarium* monospermum. *Stigmatis* indusium bivalve. *Fructus* utriculus, calycis tubo indurato inclusus. *Semen* erectum, exalbuminosum.—Herbæ *sericeæ v. pubescentes, scapigeræ;* foliis *radicalibus spathulatis;* scapis *indivisis, monocephalis;* capitulo *hemisphærico, lobato, lobis bractea foliacea subtensis;* corolla *azurea, marcescens.*

1. **Brunonia australis** (Br. Prodr. 590); foliis undique scapisque infra patentim villosis, calycis lobis longitudinaliter plumosis apice acutis.—***Smith in Linn. Trans.* x. *t.* 28.** (***Gunn*, 109.**)

HAB. Common in dry pastures in several parts of the Colony, but local, as at Launceston, Bagdad, etc.—(Fl. Oct., Nov.)

DISTRIB. Extratropical Australia: New South Wales, Victoria, South Australia, and Swan River.

Of this genus, the only one of the Natural Order to which it belongs, there are at least three species peculiar to Australia, including Tasmania; one is tropical, and a third confined to Swan River. As an Order it is allied to *Compositæ* and *Goodenoviæ*, differing much from both. The only Tasmanian species is a perennial-rooted, villous or silky herb, with spathulate, radical leaves, slender scapes, terminated by one bracteate head of small, azure blue (rarely white) flowers.—*Leaves* 2–4 inches long, narrow. *Scape* 6–12 inches high, slender, unbranched. *Heads* hemispherical, as large as a nut, lobed; outer bracts or involucral scales broad, silky, appressed, each lobe with a separate bract like the outer ones. *Flowers* each with five scarious bractlets. *Calyx*-tube very short, silky, its five lobes very narrow, feathery, with long, silky hairs. *Corolla* funnel-shaped, with a slender, split tube, very silky externally, and five linear-oblong, spreading, unequal lobes. *Stamens* five, hypogynous, with connate anthers. *Ovary* one-celled, with one erect, anatropous ovule. *Style* cylindrical. *Stigma* a minute, fleshy, blunt point, seated at the base of a two-lipped cup. *Fruit* a utriculus, surrounded by the hardened calyx-tube, which latter is crowned

by the persistent lobes. *Albumen* 0. (Named in honour of *Robert Brown*, the Botanist to Captain Flinders' Expedition, and author of the justly celebrated 'Prodromus Floræ Novæ-Hollandiæ.')

Nat. Ord. XLIV. GOODENOVIEÆ.

By far the greater number of the species of this Order are natives of Australia, whence upwards of 150 have been described. Some of them have considerable ranges, but many are very local, and several of the most remarkable genera and species are confined to South-western Australia. Most of the Tasmanian species are yellow-flowered, and blossom in December and January. Mueller has discovered a valuable bitter in some of the Victoria species.

Gen. I. DAMPIERA, *Br.*

Calycis limbus abbreviatus v. 0. *Corolla* bilabiata, tubo hinc fisso, labii superioris lobis margine interiore auriculatis. *Antheræ* imberbes, arcte cohærentes. *Ovarium* 1-ovulatum. *Stigmatis* indusium ore nudo. *Nux* crustacea.—Suffrutices *v.* herbæ *perennes;* foliis *alternis;* pedunculis *axillaribus, paucifloris;* corollis *deciduis.*

About thirty or forty species of this genus are known, all Australian, and chiefly confined to the south-west quarter. They are generally suffruticose plants, with angular branches, alternate, coriaceous, entire or toothed leaves, and rather small, axillary, blue flowers.—*Calyx*-limb very short or none. *Corolla* two-lipped, split down one side; the lobes of the upper lip auriculate on the inner margin. *Anthers* cohering. *Cup* of the stigma naked. *Ovary* one-ovuled. *Fruit* a crustaceous nut. (Named in honour of *William Dampier*, the navigator, who brought a drawing of a species of this genus, and of various other plants, from the west coast of Australia in A.D. 1699.)

1. **Dampiera stricta** (Br. Prodr. 589); herbacea, erecta, virgata, pubescens v. glabrata, caule compresso trigono, foliis sessilibus cuneatis subdentatis, pedunculis paucifloris axillaribus terminalibusque, corollis extus sericeis. (*Gunn*, 1180.)

Var. *α*; foliis supra scabris.—D. stricta, *Br. l. c.; DC. Prodr.* vii. 505; *De Vriese, Gooden.* 109.

Var. *β*; foliis supra glabris lævibus.—D. oblongata, *Br. l. c.; DC. l. c.; De Vriese, Gooden.* 106.

Hab. Var. *α*. Flinders' Island and Cape Barren Island, *Gunn.* Var. *β*. Source of the North Esk River, *Strzelecki.*—(Fl. Oct.)

Distrib. Extratropical Australia, from New South Wales to Swan River.

I have examined a very extensive suite of specimens of the *D. stricta* and *oblongata* of Brown, and find so many intermediate forms, that I have brought them together here. Of Gunn's specimens, one accords with *stricta* in the scabrous upper surface of the foliage, but the leaves are oblong-cuneate; the other with *D. oblongata*, in the leaf being glabrous above, and of exactly the same form as that of *D. stricta.*

Gen. II. SCÆVOLA, *L.*

Calycis limbus superus, 5-lobus. *Corolla* longitudinaliter fissa, limbo 5-lobo, lobis alatis conformibus. *Antheræ* liberæ. *Stigmatis* indusium ciliatum. *Drupa* carnosa v. exsucca, 2–4-locularis, loculis monospermis.—Herbæ *habitu variæ;* foliis *plerisque alternis;* floribus *axillaribus, spicatis cymosisve, interdum solitariis.*

A very large genus, several species of which are common tropical littoral plants, but by far the greater number are peculiar to Australia, where about fifty species are known. These have been divided into sections by Brown, Don, Bentham, and others, and latterly the genus has been broken up into several by De Vriese; but the structure of the flower and fruit is so similar in all, that I have not adopted the latter divisions, under one of which

(*Merkusia*, De Vriese), the Tasmanian *S. Hookeri* will come.—*Herbs* or *shrubs*, with generally alternate leaves, and axillary, solitary, racemose or cymose flowers. *Calyx-lobes* superior, five. *Corolla* split to the base, five-lobed, the lobes winged. *Stamens* free. *Stigma* surrounded by a ciliated cup. *Fruit* a dry or fleshy, two- to four-celled drupe or nut, with one seed in each cell. (Name from *scæva*, the left hand; in allusion to the form of the corolla.)

1. **Scævola Hookeri** (Muell. MSS.); herbacea, diffusa, pubescenti-pilosa, ramis elongatis, foliis obovato-oblongis spathulatis lineari-oblongisve sessilibus v. in petiolum angustatis integerrimis dentatisve acutis, pedunculis folio æquilongis brevioribusve axillaribus solitariis 1-floris, bracteis ovato-oblongis, calyce villoso, corolla et drupa pilosa.—Merkusia Hookeri, *De Vriese, Anal. Gooden.* ii. 55, *et Goodenoviæ*, 57. *t.* 12. (*Gunn*, 745, 847, 848.) (Tab. LXVII.)

Hab. Marshy places, at Rocky Cape, Mount Wellington, Hampshire Hills, Lake St. Clair, etc., *Gunn.* —(Fl. Feb.)

Distrib. South-eastern Australia: Albert River, *Mueller.*

Hairy, diffuse, very variable in size.—*Stems* creeping, branching from the root, branches 2–10 inches long. *Leaves* sessile or narrowed into a petiole, very variable in form and size, ½–2 inches long, oblong, linear-oblong, cuneate or elliptic-oblong or subspathulate, acute, quite entire or slightly or coarsely toothed. *Peduncles* axillary, solitary, sometimes as long as the leaf, usually very short. *Bracts* hairy. *Calyx* villous. *Corolla* small, dirty-white. *Nut* small, white, hairy, celled.—Plate LXVII. Fig. 1, flower; 2, corolla laid open; 3, stamen; 4, style and stigma; 5, transverse, and 6, vertical section of ovary; 7, drupe; 8, seed:—*all magnified.*

Obs. *Scævola cuneiformis*, Lab. Nov. Holl. i. 56. t. 80, described by Labillardière as a Tasmanian plant, is probably a native of South-western Australia.

Gen. III. SELLIERA, *Cav.*

Calycis tubus ovario adnatus, laciniis 5 subæqualibus. *Corolla* unilabiata, tubo fisso, laciniis apteris valvatis. *Stamina* 5, libera. *Fructus* carnosus, 2-locularis, polyspermus.—Herba *repens*; foliis *carnosis, anguste linearibus lanceolatisve*; pedunculis *axillaribus*, 1–2-*floris, bibracteolatis*; corolla *purpurascente.*

The Tasmanian species of this genus is a remarkable little plant, also found in New Zealand and extratropical South America; it is usually retained in *Goodenia*, where I left it in the 'Flora of New Zealand,' but it differs so widely in characters and habit from the other Australian *Goodenias*, that I do not think it can with consistency be retained in that genus, from which Endlicher also thinks it should be removed, and have the original generic name of Cavanilles restored to it. *S. repens* is a small, glabrous herb, generally growing in salt-marshes, with creeping stems, sometimes a foot long, very variable in robustness, and tufts of erect, fleshy, narrow-linear, linear-spathulate or lanceolate, nerveless leaves, 1–5 inches long.—*Peduncles* axillary, erect, bibracteolate, very variable in length. *Calyx* superior, of five nearly equal lobes. *Corolla* one-lipped; lobes ovate, acute, not winged, valvate in æstivation. *Anthers* free. *Fruit* a fleshy, two-celled capsule or berry, many-seeded. (Named in honour of *Natali Sellier*, the eminent Parisian engraver of Cavanilles' botanical plates.)

1. **Selliera radicans** (Cav. Ic. v. 49. t. 474. f. 2).—S. repens *et* S. radicans, *De Vriese, Gooden.* 162. Goodenia radicans, *DC. Prodr.* vii. 516. G. repens, *Lab. Nov. Holl.* i. 53, *t.* 76; *Br. Prodr.* 579; *Fl. N. Zeal.* i. 156. (*Gunn*, 79.)

Hab. Common in marshy places near the sea.—(Fl. Dec.–Feb.) (*v. v.*)

Distrib. South-eastern Australia; New Zealand; Chili.

Gen. IV. GOODENIA, *Sm.*

Calycis tubus ovario adnatus, limbus 5-partitus, laciniis æqualibus. *Corolla* irregulariter bilabiata, lobis alatis æstivatione induplicatis, tubo fisso. *Stamina* 5, antheris distinctis. *Capsula* 2-(rarius 4)-locu-

laris, dissepimento parallelo, nunc abbreviato. *Semina* imbricata, compressa.—Herbæ, *rarius* suffrutices; foliis *alternis;* floribus *axillaribus terminalibusve, flavis purpureisve.*

An Australian genus, of which about forty species are known: these are numerous both on the eastern and western parts of the Continent, and a considerable number are tropical also.—*Herbs* or *undershrubs*, with alternate leaves, and axillary or terminal yellow (in most of the Tasmanian species) flowers. *Calyx*-lobes five, equal. *Corolla* with a split tube, often bearing a gland opposite the slit, and two-lipped (rarely one-lipped) limb. *Stamens* five, attached to the corolla; filaments and anthers free. *Capsule* two-celled, with many imbricate seeds. (Named in honour of *Dr. Goodenough*, Bishop of Carlisle, an amateur Botanist.)

1. **Goodenia ovata** (Sm. Linn. Trans. ii. 347); erecta, suffruticosa, glabra, foliis ovatis acutis saccato-dentatis, calycis laciniis anguste linearibus, capsula lineari, seminibus uniseriatis.—*And. Bot. Rep. t.* 68; *Vent. Hort. Cels. t.* iii.; *Cav. Ic.* vi. *t.* 4. *t.* 506; *Br. Prodr.* 576; *DC. Prodr.* vi. 514. G. acuminata, *Br. Prodr.* 575; *De Vriese, Gooden.* 140. (*Gunn*, 45.)

Hab. Abundant in copse-woods, etc.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. South-eastern Australia, from Sydney to South Australia.

An erect shrub, 2–4 feet high.—*Branches* slender. *Leaves* petiolate, ovate, acute or subacute, 1–2 inches long, sharply toothed, the petioles sometimes with a tuft of wool in the axil. *Flowers* in axillary, trifid peduncles, yellow. *Calyx-lobes* very narrow and slender.—The *G. acuminata*, Br., does not appear to be distinct from *G. ovata*.

2. **Goodenia geniculata** (Br. Prodr. 577); herbacea, subsericeo-pilosa, eglandulosa, rhizomate subrepente, foliis plerisque radicalibus anguste lanceolato-spathulatis elongatis obtusis subcoriaceis integerrimis dentatisve, scapis gracilibus medio bibracteolatis fructiferis geniculato-deflexis, calycis villosi lobis linearibus obtusis.—*DC. Prodr.* vii. 514; *De Vriese, Gooden.* 136. (*Gunn*, 846.)

Hab. Rocky Cape, in poor sandy soil, *Gunn.*—(Fl. Dec.)

Distrib. South-eastern Australia: Port Phillip, *Gunn;* Melbourne, *Adamson, etc.*

A scarce plant in Tasmania, but apparently common on the opposite coast of Australia. Mr. Mueller sends the *G. hederacea*, Sm., as a variety of it, but I have seen no intermediate states, though such very likely occur.—A small species, 2–4 inches high, more or less covered with silky hairs. *Rhizomes* branched, creeping. *Leaves* almost all radical, very narrow-lanceolate, spathulate or linear, entire or remotely toothed. *Scapes* slender, longer than the leaves, erect, single-flowered, with two opposite, linear bracts about the middle, the part above the bracts reflexed suddenly when in fruit. *Flowers* large, yellow, $\frac{1}{2}$–$\frac{2}{3}$ inch across. *Calyx* villous. *Lobes* of the corolla with broad wings, pubescent in the centre of the back.

3. **Goodenia hederacea** (Sm. in Linn. Trans. ii. 349); subacaulis, herbacea, pubescens v. lanata, eglandulosa, ramis gracilibus prostratis, foliis obovatis rotundatis spathulatis oblongisve obtusis varie crenato-dentatis sublobulatisve, pedunculis scapiformibus 1–3-floris, calycis tubo villoso laciniis lineari-oblongis.—*Br. Prodr.* 577; *DC. Prodr.* 514; *De Vriese, Gooden.* 147. G. lanata, *Br. et DC. l. c.; De Vriese, Gooden.* 146. (*Gunn*, 430.)

Hab. Common in dry pastures, etc.—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia: Victoria, *Mueller.*

Herbaceous, pubescent or tomentose.—*Branches* slender, prostrate, 3–5 inches long. *Radical leaves* very numerous, 1–2 inches long, narrowed into the petiole, obovate or spathulate or oblong, blunt, sinuate, toothed or remotely lobulate. *Peduncles* slender, axillary, erect, one- to three-flowered, when divided bracteate at the axils. *Flowers* yellow, conspicuous, nearly 1 inch across. *Calyx*-lobes long, linear-oblong, its tube villous. *Corolla*-lobes with broad, wavy margins.

4. **Goodenia elongata** (Lab. Nov. Holl. i. 52. t. 75); pilosa v. glabrata, herbacea, caulibus erectis

gracilibus, foliis radicalibus spathulatis late v. anguste lanceolatis oblongisve integerrimis subsinuatisve, pedunculis axillaribus terminalibusque gracilibus ebracteatis 1-floris fructiferis reflexis.—*Br. Prodr.* 577; *DC. Prodr.* vi. 515; *De Vriese, Gooden.* 148. (*Gunn*, 48.)

Hab. Not uncommon in marshy soil in various parts of the Colony.—(Fl. Dec.)

Distrib. South-eastern Australia, from Sydney to Victoria.

A slender, herbaceous, glabrous species, or with occasionally a few appressed hairs.—*Stems* several from the root, slender, erect, a span to 10 inches long. *Radical leaves* 1–3 inches long, spathulate, oblong or lanceolate-oblong, contracted into a short or long petiole, blunt or subacute, quite entire or sinuate; cauline leaves few, narrow. *Peduncles* slender, axillary and terminal, one-flowered, reflexed in fruit. *Calyx*-tube short, obconic; lobes oblong-lanceolate. *Corolla* deep yellow, about ½ inch across; lobes obovate-cuneate, almost glabrous.—Mueller's Victoria specimens of this have larger flowers and coarsely toothed leaves.

5. **Goodenia humilis** (Br. Prodr. 575); caule scapiformi paniculatim ramoso pubescente-piloso, foliis radicalibus (v. e rhizomate repente) numerosis anguste linearibus lineari-lanceolatisve glaberrimis v. inferne pilosis integerrimis v. subdentatis, calycis tubus dense pubescentibus pilis patulis lobis anguste linearibus.—*DC. Prodr.* vii. 513. G. graminifolia, *Nob. in Lond. Journ. Bot.* vi. 265. G. nana, *De Vriese, Gooden.* 132, 133. (*Gunn*, 1177.) (Tab. LXVIII. *A.*)

Hab. Northern parts of the Island, in marshy soil: Georgetown, margin of Lake St. Clair, and Flinders' Island, *Gunn.*—(Fl. Dec., Jan.)

Distrib. Victoria.

Very variable in size, from 1–8 inches high; easily recognized by the long, slender, numerous, radical leaves, and pubescent, scape-like, paniculate, erect stems, with several flowers.—*Rhizomes* very short, or sometimes creeping. *Radical leaves* narrow-linear or lanceolate, rarely oblong-lanceolate, acute, quite entire or very obscurely sinuate, glabrous or pilose below the middle. *Stems* or scapes branching, very pubescent with spreading hairs (as are the calyces), branching above, each branch bracteate at the base, and bearing a single deep yellow flower.—Plate LXVIII. *A.*

Obs. I am unacquainted with *G. barbata*, Br., described as being erect, glandular, pubescent, with entire, linear-lanceolate leaves, single-flowered pedicels, a bearded throat to the corolla, style longitudinally hirsute, and one-celled, two- or three-seeded capsules.

Gen. V. VELLEIA, *Sm.*

Calyx inferus, 3–5-phyllus, lobis inæqualibus. *Corolla* tubo basi ovario accreta, apice hinc fisso, limbo bilabiato. *Stamina* distincta, glandula epigyna inter 2 anteriora. *Stylus* indivisus. *Capsula* basi 2-loculari, valvis bipartitis; *semina* plurima, imbricata.—Herbæ *acaules, subscapigeræ*; foliis *radicalibus, spathulatis*; scapis *dichotomis, axillis plerisque floriferis, bracteis oppositis*; corolla *flava*; stigmatis indusio *maximo.*

An Australian genus, of about eight species, found on all parts of the coast. In habit it much resembles *Goodenia*, but differs in the free calyx, more unequal calyx-lobes, one-lipped corolla, slit at the top of the tube only. (Named in honour of *Major Velley*, an Algologist.)

1. **Velleia paradoxa** (Br. Prodr. 580); pubescenti-pilosa, foliis elliptico-lanceolatis petiolatis obtuse dentatis, bracteis integris lobatisve, calyce 5-partito, corolla basi calcarata.—*DC. Prodr.* vii. 518; *De Vriese, Gooden.* 172. (*Gunn*, 46.)

Hab. Not uncommon in many parts of the Island, *Gunn.*—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia, from Sydney to Adelaide.

Plant very variable in size, from 2 inches to a foot high; also in amount of pubescence, and the size of the flower, and size and shape of the calyx-lobes and bracts.—*Leaves* oblong-lanceolate, bluntly toothed, petiolate, 2–3 inches long. *Scapes* stout, erect, often trichotomously branched above the middle; bracts entire or lobed or cleft to the base, and, as well as the peduncles and pedicels, densely pubescent. *Flowers* inclined. *Calyx*-lobes linear-oblong, blunt, entire, longer than the tube of the corolla. *Corolla* with a short spur that projects downwards between the calyx-lobes, and is persistent after the fall of the corolla.

2. **Velleia montana** (Hook. fil. in Lond. Journ. Bot. vi. 265); depressa, pilosa v. glabrata, foliis stellatim patentibus lanceolato- v. oblongo-spathulatis obtusis integerrimis v. subdentatis, scapis brevibus, calycis lobis 3 lineari- v. ovato-oblongis basi edentulis, corolla ecalcarata.—*De Vriese, Gooden.* 176. (*Gunn,* 227.) (Tab. LXVIII. *B.*)

Hab. Mountainous districts, forming large patches, as at Marlborough, Arthur's Lakes, Hampshire Hills, Western Mountains, etc., *Lawrence, Gunn, etc.*—(Fl. Dec.–Feb.)

Distrib. Alps of South-eastern Australia: Snowy Plains, 4–5000 feet elevation, *Mueller.*

A small, depressed species, with numerous radical, spreading leaves, very short scapes, small flowers, with three-leaved calyx, and corolla without any spur.—*Leaves* 2–4 inches long, spathulate, entire or rarely obscurely toothed, pubescent and pilose or glabrous. *Scapes* shorter than the leaves, slender, branched, and, as well as the broadly-oblong or linear-oblong calyx-lobes, more or less pubescent. *Corolla* of a dingy reddish colour.—Plate LXVIII. *B.* Fig. 1, flower; 2, the same cut open; 3, transverse section of ovary:—*all magnified.*

Goodenia rotundifolia, Br., and *Euthales trinervis,* Br., are stated by De Vriese (Gooden., pp. 145 and 169) to have been found in Tasmania by Baron Hügel; but they have not been detected by any other collector, and I suspect some mistake.

Nat. Ord. XLV. STYLIDIEÆ.

Of this eminently Australian Natural Order a few genera and about seventy species are known. Of these genera, *Stylidium* is the only large one, and is confined to Australia, with the exception of three species which inhabit Eastern Bengal, Malacca, and Ceylon. Of the second genus, *Leeuwenhoekia,* only two species are known, natives of Australia; the third, *Forstera,* contains several New Zealand, one Fuegian, and one Tasmanian species. The majority of the Natural Order are found along the south coast of Australia, and are pretty equally distributed; there are several tropical species, but comparatively few Tasmanian.

Gen. I. STYLIDIUM, *Swartz.*

Calycis limbus bilabiatus. *Corolla* irregularis, 5-fida, lacinia quinta (labello) dissimili, minore, deflexa (raro porrecta), reliquis patentibus (raro geminatim cohærentibus). *Columna* reclinata. *Antheræ* 2-lobæ, lobis divaricatis. *Stigma* obtusum, indivisum. *Capsula* bilocularis, dissepimento superne quandoque incompleto.—Herbæ *v.* suffruticuli, *glaberrima v. piloso-glandulosa;* foliis *radicalibus, rosulatis, rarius sparsis;* inflorescentia *varia.*

This curious genus is familiar to most persons who are even slightly acquainted with botany, on account of the irritability of the column of the combined stamens and style; this is bent back with a double flexure, with its top reposing on the labellum of the corolla, and when irritated at the bend externally, it turns over with a sudden jerk, and rests on the opposite side of the flower, scattering the pollen in the operation. The genus *Stylidium* may be distinguished from *Forstera* by the unequal lobes of the corolla, one of which forms a lip, by the double flexure of the irritable column, and by the undivided stigma. (Name from στυλος, *a column;* in allusion to the column of stamens and style.)

1. **Stylidium graminifolium** (Swartz, Mag. Nat. Ges. Berl. 47. t. 1. f. 1); foliis omnibus radicalibus anguste linearibus, scapo aphyllo glanduloso piloso, racemo subspicato simplici, labello basi appendiculato.—*Br. Prodr.* 568; *DC. Prodr.* vii. 333; *Bot. Reg.* i. *t.* 90; *Bot. Mag.* 44. *t.* 1918. Ventenatia major, *Smith, Exot. Bot.* ii. 13. *t.* 66. Candollea serrulata, *Lab. in Ann. du Mus.* vi. 414. *t.* 64. *f.* 2. (*Gunn*, 102, 1181, 1980, 2029.)

Var. *α*; foliis margine denticulatis.

Var. *β*; foliis margine lævibus.—S. melastachys, *Br. Prodr.* 568. S. Armeria, *Lab. Nov. Holl.* ii. 66. *t.* 216.

Hab. Very abundant throughout the Colony, from the level of the sea to 4000 feet.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern and Southern Australia, from Port Stephens to South Australia.

I am unable to distinguish more than one species amongst the many forms of this common plant which Gunn has sent me. In its usual state it forms a somewhat tufted plant, 8–10 inches high, with fibrous roots, very numerous, rigid, radical, linear leaves, and a slender scape, bearing a spike of shortly-pedicelled flowers; from the mountains I have specimens not 2 inches high, and it further varies extremely in the comparative length of the leaves and scapes, in the breadth and rigidity of the leaves, in their smooth or serrulate margins, in the more or less glandular or pilose calyx and scape, which bears from three or four to thirty or forty flowers, in the size of the flowers, and length and breadth of the lobes of the corolla, and their equality or inequality.—*Flowers* pink (rarely yellowish?), turning purple in drying, sometimes white. In some of Gunn's specimens (No. 2029) the panicle is in a monstrous state, branched, and the calycine lobes show a tendency to become foliaceous, and the lobes of the corolla to become regular. I have specimens from New Zealand, said to have been gathered near Auckland, but suspect either some mistake, or that the plant has been introduced there.

2. **Stylidium despectum** (Br. Prodr. 371); parvulum, glaberrimum, foliis paucis squamæformibus, caule superne dichotome ramoso, ramis paucifloris, calycis tubo lineari-elongato, corolla minima, limbi laciniis inæqualibus fauce nuda, labello inappendiculato basi tubo adnato.—*DC. Prodr.* vii. 336. S. inundatum, *Br. et DC. ll. cc.* (*Gunn*, 437.)

Hab. Western Plains, Circular Head, *Backhouse;* sandy soil, Georgetown, *Gunn.*—(Fl. Sept.)

Distrib. South-eastern Australia: Victoria, *Mueller.*

A very different-looking plant from *S. graminifolium*, being a small, almost leafless, glabrous, rather succulent herb, 1–3 inches high, with the stem rather stout, simple below, and dichotomously branched above.—*Leaves* very few, minute, scale-like, linear-ovate. *Flowers* terminating the branches, very inconspicuous, shortly pedicelled: pedicels bracteate at the base. *Calyx*-tube about ¼ inch long, slender, its lobes oblong. *Corolla* very small: its lobes rather unequal.—I cannot distinguish the Tasmanian specimens from Mueller's Victoria ones of *S. inundatum*

3. **Stylidium perpusillum** (Hook. fil. in Lond. Journ. Bot. vi. 266); gracillimum, glanduloso-puberulum, foliis radicalibus lineari- v. obovato-spathulatis, scapis 1–3-floris, pedicellis elongatis, calycis tubo globoso, corollæ tubo brevissimo fauce nuda laciniis subdentatis, labello inappendiculato. (*Gunn*, 1226.)

Hab. In wet sandy soil at Georgetown, common, *Gunn.*—(Fl. Oct., Nov.)

This curious little plant perfectly resembles Bauer's drawing of *S. calcaratum*, except in wanting the spur to the corolla.—*Whole* plant 1–1½ inch high, extremely slender, more or less glandular. *Roots* of minute fibres. *Leaves* all radical, 1 line long, spathulate. *Scape* no thicker than a thread, bearing one to four flowers, of which the lateral are on long, ascending, slender pedicels, forming a sort of umbel. *Calyx*-tube globose, its lobes oblong, blunt. *Corolla* white, very short, its lobes spreading, unequal.

Obs. Of *Stylidium umbellatum*, Lab. Nov. Holl. ii. 66. t. 217, described as a native of Van Diemen's Land.

I have no specimens. Mr. Gunn suggests that it may be a monstrous state of *S. graminifolium*, and sends forms of that plant, resembling it in habit and in the inflorescence.

Gen. II. FORSTERA, *Linn. fil.*

Flores monoici v. dioici. *Calyx* 1–3-bracteolatus; limbus 3–6-partitus. *Corolla* campanulata; limbus 4–9-fidus; faux nuda v. glanduloso-incrassata. *Glandulæ* epigynæ staminibus alternæ. *Antheræ* 2, ad apicem columnæ oppositæ, rima transversali dehiscentes. *Stigma* 2-lobum v. stigmata 2, floribus fertilibus porrecta, plumosa, masculis intra antheras occlusa. *Ovarium* 1–2-loculare; *ovula* plurima, columnæ centrali affixa, ascendentia, anatropa. *Fructus* capsularis, 1-locularis, septicide? bivalvis. *Semina* minima, conferta; testa reticulata.—Herbæ *perennes, solitariæ, simplices v. ramis dense congestis muscoideæ;* folia *alterna, imbricata;* flores *sessiles v. pedunculati, albi.*

Very remarkable alpine plants of Tasmania, New Zealand, and Fuegia, nearly allied to *Stylidium.*—*Stems* simple and solitary in the Tasmanian species, in others branched and densely tufted, forming broad, hard, mossy patches. The *F. bellidifolia* is a small, scapigerous species, with a rosulate tuft of coriacous, spathulate leaves, each about ½–1 inch long. *Scape* 3–5 inches long, slender, one- (rarely two-) flowered, with one to three bracts at the top. *Flowers* small, white, inclined. *Ovary* turgid, two (?)-celled, with many ovules. *Calyx*-lobes six, erect, blunt, minutely ciliate. *Corolla* white, campanulate, with a five-lobed, spreading limb, and short tube; the lobes linear-oblong, blunt, with small, bifid lobules in the angles. *Stamens* and *style* united into a central, erect column, surmounting the ovary, having at its base two large glands. *Anthers* on the top of the column sessile, bursting transversely, the two halves hooded, upper turned back. *Stigma* two-lobed, inconspicuous in the male flowers, plumose and spreading in the fertile. *Fruit* a membranous, many-seeded capsule. (Named in honour of *J. R. Forster*, the Naturalist who accompanied Captain Cook's second voyage.)

1. **Forstera bellidifolia** (Hook. Ic. Pl. t. 851); foliis omnibus radicalibus elliptico-oblongis obtusis spathulatis coriaceis glaberrimis integerrimis, scapo gracili 1-floro apicem versus bracteolato, flore inclinato, calycis tubo globoso, limbo breviter campanulato inæqualiter breviter 5-lobo, lobis ciliolatis, corollæ tubo brevi, lobis 6 lineari-oblongis obtusis lobulis bifidis interjectis, stigmatis lobis inæqualibus, inferiore decurvo longiore, capsula oblonga. (*Gunn*, 277.)

Hab. Mount Sorrell, and summit of the range above Birches Inlet, Macquarrie Harbour, *Milligan, Gunn.*—(Fl. Dec.)

Nat. Ord. XLVI. LOBELIACEÆ.

There are about forty species of this Order known to inhabit Australia, most of them belonging to the genus *Lobelia* itself. They are pretty equally distributed along the coasts of the Continent, a few being common to both the eastern and western divisions, and one, *Lobelia anceps*, to various other parts of the world. As an Order, *Lobeliaceæ* are hardly separable from *Campanulaceæ*, and some varieties of the Tasmanian Campanulaceous genus, *Wahlenbergia saxicola*, having a slightly irregular corolla, break down one of the best characters that separate them.

Gen. I. LOBELIA, *L.*

Calyx 5-lobus, tubo obconico, ovoideo v. hemisphærico. *Corolla* superne longitudinaliter fissa, bilabiata, tubo recto v. paulo curvo, labio superiore minore inferiore latiore patente 3-lobo. *Antheræ* 2, inferiores v. rarius omnes apice barbatæ. *Capsula* 2-locularis, apice valvis porisve dehiscens.—*Species* Tasmaniæ *omnes herbaceæ;* foliis *alternis;* floribus *axillaribus v. racemoso-spicatis;* corolla *plerisque pallide cærulea.*

A very extensive genus, found in all parts of the temperate and tropical world, of which the Australian species are for the most part insignificant and often creeping weeds; but some are erect and rather pretty plants.—*Leaves* alternate. *Flowers* axillary or in terminal racemes, usually pale blue. *Calyx*-tube obconic or ovoid, often gibbous, its lobes five, unequal, sometimes one- or two-toothed. *Corolla* with a nearly straight tube, slit down the back, two-lipped; upper lip smaller, lower three-lobed. *Stamens* epigynous or inserted on the corolla. *Anthers* combined into a tube, two or more bearded at their tips. *Capsule* membranous or coriaceous, often gibbous, two-celled, many-seeded, dehiscing at the apex. (Named in honour of *Mathias de L'Obel*, a Flemish botanist and author.)

1. **Lobelia anceps** (Thunb. Prodr. Cap. 40); glaberrima, caule compresso trigono angulis alatis erecto v. basi decumbente, foliis decurrentibus linearibus lanceolatis spathulatis cuneatisve integerrimis v. dentatis, pedunculis axillaribus folio brevioribus, capsulis cylindraceis.—L. alata *et* L. cuneiformis, *Lab. Nov. Holl.* 51. *t.* 72 *et* 73; *Br. Prodr.* 561. (*Gunn*, 395.)

Hab. Common in marshy places, especially near the sea.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. Throughout Tropical and South-eastern and South-western Australia, New Zealand, Chili, and South Africa.

An erect or decumbent, simple or branched, smooth herb, with weak, flattened, three-angled, winged stems and branches, a foot or so high.—*Leaves* 1–3 inches long, contracted into rather broad, decurrent petioles, very variable in shape, linear-lanceolate, spathulate or much elongated and ligulate, sharp, entire or waved, and toothed. *Peduncles* solitary, axillary, short, 2–4 lines long, much shorter than the leaves amongst which they rise, but rarely the branches become racemose at the end, the upper leaves being reduced to bracts below the peduncles. *Flowers* inconspicuous. *Ovarium* narrow, much elongated when ripening. *Corolla* short, pale blue. *Capsule* variable in size, $\frac{1}{3}$ to 1 inch long.

2. **Lobelia surrepens** (Hook. fil.); parvula, glabra, caulibus brevibus (pollicaribus) repentibus crassis, foliis approximatis obovato-lanceolatis oblongo-spathulatisve obtusis integerrimis in petiolum brevem angustatis carnosiusculis basi interdum subciliatis, pedunculis folio brevioribus axillaribus 1-floris, calycis tubo brevi obconico glaberrimo, lobis brevibus triangulari-ovatis, corollæ tubo calyce subduplo longiore laciniis oblongis, staminibus basi corollæ insertis. (*Gunn*, 1179.) (Tab. LXIX. *A.*)

Hab. Alpine places, 3–4000 feet, in marshy ground: Arthur's Lakes, Marlborough, summit of Western Mountains, etc., *Gunn.*—(Fl. Jan.)

This little species is most nearly allied to *L. anceps*, and resembles a dwarf, stunted form of that species, but the whole plant is not more than 2 inches long, with crowded foliage, and the short ovaries and fruit at once distinguish it.—Glabrous, or minutely ciliated at the base of the upper leaves only. *Stems* creeping, short, stout, 1–2 inches long. *Leaves* crowded, rather fleshy, obovate or oblong or lanceolate-spathulate, narrowed into a short petiole, blunt, quite entire or obscurely toothed. *Peduncles* solitary, axillary, shorter than the leaves. *Flowers* small, pale blue. *Stamens* inserted at the very base of the tube of the corolla.—Plate LXIX. *A*. Fig. 1, flower; 2, corolla laid open, showing the insertions of the stamens; 3, ovary and style; 4, transverse section of ovary:—*all magnified.*

3. **Lobelia pedunculata** (Brown, Prodr. 562); pubescens v. glabrata, caulibus repentibus intricatisve ramosis gracilibus, foliis parvis distichis petiolulatis ovatis grosse dentatis, pedunculis axillaribus brevibus elongatisve calycibusque pubescentibus, calycis tubo brevi lobis subulatis triangularibusve, corollæ tubo breviusculo, staminibus basi tubi corollæ fissi insertis.—*DC. Prodr.* vii. 367. (*Gunn*, 550.) (Tab. LXIX. *B.*)

Hab. Not uncommon in good soil, where damp: on the margin of rivers, and occasionally on the mountains, *Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to Victoria.

A very small species, but often forming large green patches in moist places.—*Stems* creeping, very slender, much branched. *Leaves* numerous, distichous, membranous, on very short petioles, ovate, deeply toothed, ¼ inch long, glabrous or pubescent. *Peduncles* longer or shorter than the leaves, pubescent. *Flowers* small, blue or white. *Stamens* inserted at the very base of the tube of the corolla.—Plate LXIX. *B.* Fig. 1, flower; 2, corolla laid open, showing the insertions of the stamens; 3, ovary and style; 4, transverse section of ovary:—*all magnified.*

4. **Lobelia fluviatilis** (Br. Prodr. 563); glaberrima v. glabriuscula, pusilla, caule gracili brevi repente, foliis obovato-oblongis in petiolum brevem angustatis subacutis sinuato-dentatis, pedunculis axillaribus folio longioribus ebracteolatis, calycis tubo glabrato v. puberulo lobis triangulari-subulatis, filamentis medio tubi integri corollæ insertis.—*DC. Prodr.* vii. 366. (*Gunn,* 550.) (Tab. LXX.)

Hab. Marshy places near Launceston, *Gunn.*—(Fl. Jan.)

Distrib. South-eastern Australia: New South Wales and Victoria.

A small, creeping species, glabrous or nearly so.—*Stems* slender, 2–4 inches long. *Leaves* about ⅓ inch long, obovate-spathulate, bluntly dentate or sinuate-dentate, subacute. *Peduncles* much longer than the leaves. *Ovary* short, glabrous or slightly pubescent. *Corolla* with an entire tube, on which the stamens are inserted rather above the middle.—Plate LXX. Fig. 1, flower; 2, corolla with the tube laid open, showing the insertion of the stamens; 3, ovary and style; 4, transverse section of ovary:—*all magnified.*

5. **Lobelia irrigua** (Br. Prodr. 563); "repens muscosa glabra, foliis crassiusculis subrotundis dentato-crenatis petiolatis pedunculo ebracteato longioribus, corollæ tubo longitudinaliter fisso, limbi laciniis subæqualibus, staminibus epigynis."—*DC. Prodr.* vii. 367.

Hab. Tasmania, *Brown.*

Distrib. South coast of Australia, *Brown.*

I have seen Brown's specimens of this plant, which differs from those described above in the small size, minute, fleshy leaves, not ⅛ inch long, which are rounded, shortly petioled, and bluntly toothed; the peduncle is very short, without bracts, the tube of the corolla split, and the stamens are described as epigynous.

6. **Lobelia gibbosa** (Lab. Nov. Holl. i. 50. t. 71); glabra, caule erecto tereti simplici v. diviso, foliis paucis linearibus integerrimis v. paucidentatis carnosulis, racemo secundo, pedicellis calyce brevioribus, corollæ labiis valde inæqualibus superiore imberbi v. barbato laciniis acutis, capsula hinc gibba.—*Br. Prodr.* 564; *DC. Prodr.* vii. 358. L. simplicicaulis, *Br.* et *DC. l. c.* (*Gunn,* 104, 514.)

Hab. Abundant in light, sandy soil.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. South-eastern and South-western Australia.

A very common and beautiful species, almost leafless or with very narrow leaves, easily recognized by its erect, slender habit, and racemes of deep blue flowers, with gibbous ovaries. I cannot distinguish Brown's *L. gibbosa* and *L. simplicicaulis* from one another.—A slender, erect, simple or branched plant, 6–18 inches tall. *Stems* stout or flexuous, glabrous or slightly pubescent, terete. *Branches* erect, leafless. *Leaves* few, alternate, very narrow, linear, subulate or filiform, fleshy, sometimes broader and irregularly toothed. *Flowers* in terminal racemes, few or many, on short, stiff pedicels. *Calyx-lobes* subulate, shorter than the tube of the deep blue corolla.

Nat. Ord. XLVII. CAMPANULACEÆ.

Australia numbers very few (about four) plants of this family, which abounds in beautiful genera and species in the temperate regions of the northern hemisphere, as also in South Africa. These all belong to the genus *Wahlenbergia,* and perhaps to one extremely variable species, which is found in various other parts of the globe.

Gen. I. WAHLENBERGIA, *Schrad.*

Calycis limbus 3–5-fidus. *Corolla* campanulata, 3–5-loba. *Filamenta* basi vix dilatata. *Stigma* pilosum, 2–3-lobum. *Capsula* 3-locularis, apice intra lobos calycis 3-valvis.—Herbæ *lactescentes*; foliis ***alternis, rarius oppositis.***

A very large genus, especially abounding in the South temperate zone, and there representing the genus *Campanula* of the Northern. The Australian species are very variable plants, and, as Brown has suggested, may all be referable to one polymorphous species.—*Herbs*, with milky juice, slender stems and branches, alternate leaves, and usually nodding, blue, bell-shaped flowers, on slender, terminal peduncles. *Calyx* three- to five-lobed. *Corolla* persistent, campanulate, three- to five-lobed. *Filaments* somewhat dilated at the base. *Stigma* hairy, two- or three-lobed. *Capsule* three-celled, opening by three valves at the apex between the calyx-lobes. (Named in honour of *G. Wahlenberg*, an eminent Swedish Botanist.)

1. **Wahlenbergia gracilis** (A. DC. Mon. Camp. 142); glaberrima v. hispido-pilosa, caule gracili striato v. angulato simplici v. e basi ramoso erecto v. inferne decumbente, ramis apice sub-1-floris, foliis sessilibus v. petiolatis linearibus lanceolatis oblongisve acuminatis radicalibus inferioribusve oppositis petiolatis spathulatis integerrimis sinuatis dentatisve plerumque siccitate crispatis cartilagineo-marginatis, floribus 3–5-fidis, corolla ovario breviore v. longiore, capsula subglobosa oblonga v. obconica.—*DC. Prodr.* vii. 433. Campanula gracilis, *Forst. Prodr.* 84; *Bot. Mag.* 691; *Br. Prodr.* 561; *Fl. N. Zeal.* i. 159. C. vincæflora, *Vent. Jard. Malm. t.* 12. C. capillaris, *Lodd. Bot. Cab.* 1406.

Var. *vincæflora*, Br.; perennis, radice repente, foliis plerisque radicalibus glaberrimis ciliatisve, floribus magnis intensius cæruleis, stylo porrecto. (*Gunn*, 72, 850.)

Var. *littoralis*, Br.; minor, ramosa, annua, radice fibrosa, foliis plerisque caulinis pilosis, floribus minoribus pallide cæruleis, stylo subincluso. (*Gunn*, 165, 849.)

Hab. Abundant in dry places throughout the Island.—(Fl. all summer.) (*v. v.*)

Distrib. Tropical and extratropical Australia, New Zealand, New Caledonia, East Indies. (Cultivated in England.)

Mr. Gunn assures me that the two above-enumerated varieties are distinct species, and that he has sent specimens of both from spots where they grew intermixed, and still retained their characters. I have given his diagnoses of them, and have only to add, that more of his specimens combine the characters of both than confine themselves to those of the one, and that many intermediate forms occur also in Australia and New Zealand, besides others, partaking more or less of these characters combined, with some that are foreign to both. In such a case as this, the subject must be left to the local observer, who however must not dwell too much upon the fact of species or races retaining their characters when grown side by side, in one place, if they do not do so in all.—One of the most variable plants in Tasmania. *Stems* simple, 1 inch to 2 feet high, generally slender, angled or striated, branched from the base or throughout their whole length, in a paniculate manner; the branches terminating in long, generally slender peduncles; smooth or hispid, with stiff white hairs, leafy or with very few leaves. *Leaves* usually linear, sessile, sharp, toothed or waved or crisped or quite entire, margin often cartilaginous and white; lower ones sometimes spathulate, toothed, and petioled. *Flowers* extremely variable in number, and in the size and length of the corolla, calyx-lobes, and ovarium, three and five being the prevailing numbers of lobes and stamens, and the length from 3 lines to ½ inch. *Corolla* bell-shaped, white or blue, usually small, 2 lines or ⅓ inch long, sometimes large, especially in Tasmania, where it forms a large blue bell, ¾ inch across the mouth. *Capsule* extremely variable in size and shape, 1 line to ½ inch long, nearly globose or oblong or linear-obconic.

2. **Wahlenbergia saxicola** (A. DC. Mon. Camp. 144); glabra, scapigera, caule abbreviato simplici v. decumbente ramoso, foliis radicalibus v. ad apices ramulorum confertis petiolatis lineari-spathulatis obtuse dentatis, pedunculis scapiformibus elongatis unifloris nudis v. basin versus 1-foliatis, floribus 4–5-fidis,

corolla plerumque obliqua segmentis inæqualibus, staminibus 2 apice appendiculatis, capsula subglobosa.—*Fl. N. Zeal.* i. 160. Campanula saxicola, *Br. Prodr.* 562. Streleskia montana, *Nob. in Lond. Journ. Bot.* vi. 266. (*Gunn*, 1178.) (Tab. LXXI.)

Hab. Summit of Mount Wellington, *Gunn.*—(Fl. Jan.)

Distrib. Mountains of New Zealand.

This is in many respects a remarkable plant; in Tasmania it appears to be scarce, and all my specimens are very uniform in size and appearance, being 1–2 inches high, perfectly glabrous, with several rather membranous, linear-spathulate, blunt leaves, $\frac{1}{2}$–1 inch long, and a slender, naked scape, bearing a small, nearly erect or inclined flower, with an oblique, four-cleft corolla, about $\frac{1}{3}$ inch across, and four stamens, of which one or two are furnished at the top of the anther with a small claw. In this state it is so unlike *Wahlenbergia gracilis* as to have misled me altogether, both as to its affinities and the Natural Order to which it should have been referred. I placed it among *Lobeliaceæ*, relying chiefly on the unequal stamens, the structure of the anthers, and the oblique corolla, and I further named it in honour of my friend Count Strzelecki, the eminent Australian traveller. When studying the New Zealand *Campanulaceæ* however, I found that a common mountain plant of that country not only perfectly accorded with Brown's character of *C. saxatilis*, but presented almost as many varieties as *C. gracilis* itself, of which some of the caulescent ones passed into forms of *gracilis*, and smaller dwarf ones into *Streleskia*, thus confirming Brown's observation of *C. saxatilis*, "præcedenti (*C. gracili*) proxima, at distincta videtur." Some of the New Zealand forms have flowers quite as large as those of *C. gracilis*, var. *vincæflora*, and with five extremely unequal lobes; in others the corolla is four- or five-cleft, and perfectly regular; the stamens also vary much in the length of the filament, breadth of its base, and inequality of the anthers; but I do not find any so markedly Lobeliaceous as the Tasmanian specimens, in which the two larger stamens have broad, ciliated bases to the filaments. The plant is worthy of a very attentive study, for it is the most instructive I know of, as proving the close affinity of *Campanulaceæ* and *Lobeliaceæ*, and the numerous deceptive forms that species may assume.—Plate LXXI. Fig. *A*, Tasmanian, and *B*, New Zealand specimens; Fig. 1, 2, and 3, corollas of different forms and ages; 4, stamens; 5, stigma; 6, ovary cut transversely:—*all magnified.*

Nat. Ord. XLVIII. ERICEÆ.

The replacement of the *Ericeæ* of all other temperate regions of the world, by *Epacrideæ* in Australia, is one of the most singular phenomena in the geographical distribution of plants; and what is even more singular, the few Australian *Ericeæ* which do exist are confined to the mountains of Tasmania, with the exception of one of them, which has been recently found by Mueller on the Australian Alps.

Gen. I. GAULTHERIA, *L.*

Calyx 5-fidus. *Corolla* ovata v. urceolata, ore contracto breviter 5-fida, lobis recurvis. *Stamina* 10; filamenta plana, basi dilatata, hypogyna v. imo corollæ inserta; antherarum loculi biaristati. *Ovarium* 5-loculare, basi glandulis 10 liberis connatisve suffultum. *Capsula* sæpissime calyce baccato inclusa, 5-locularis, loculicide 5-valvis. *Placentæ* imo columnæ adnatæ. *Semina* angulata; testa reticulata.—Frutices *plerumque hispidæ v. setosæ;* foliis *alternis* (*rarissime oppositis*), *coriaceis, semperviridibus;* floribus *axillaribus terminalibusve, racemosis, rarius solitariis, albis;* calycibus *baccatis, albis, rubris cæruleisve.*

Gaultheria is a large genus, abounding in humid, mountainous regions within the tropics, and also found in temperate North and South America and in New Zealand, but not in Europe, nor in Asia north of the Himalaya, nor in any part of Africa. The few Australian species are confined to the Australian Alps and to Tasmania, and all are very variable in stature and foliage. The berried fruit arising from the enlarged calyx is a prominent fea-

ture in many species, and mainly distinguishing the genus from *Andromeda*, *Pieris*, etc., but is variable in degree, and in *G. antipoda* and others ripe capsular and berried fruit may be found on the same branch.—Rigid, branching, evergreen (sometimes prostrate) shrubs, with alternate (rarely opposite), coriaceous, reticulated, often glossy, toothed or crenate leaves, and often setose branchlets. *Flowers* axillary or terminal, solitary or in few- or many-flowered racemes, white, succeeded by dry capsules, which are generally covered with the enlarged, fleshy, quinquefid calyx. *Corolla* urceolate, with a small five-lobed mouth. *Stamens* ten, included; filaments flat, dilated below, often hairy; anther-lobes elongated upwards, where they open by a pore, and are each terminated by two bristles. *Ovary* five-celled, surrounded at the base by five glands or a ten-lobed disc. *Capsule* small, coriaceous, quite free or surrounded by the persistent calyx, which sometimes becomes fleshy, and forms a berry: when this is the case the capsule, though enclosed in the calyx, is free except at the point of attachment, splitting down the back of the cells. *Seeds* numerous, minute, attached to placentæ at the base of each cell. The placentæ are united to a central column, which remains after the valves separate. (Named in honour of *M. M. Gaultier*, a French physician, who settled in Canada, and wrote a work on the Sugar-Maple.)

1. **Gaultheria hispida** (Br. Prodr. i. 558); erecta, ramis setoso-hispidis setis patulis appressisve, foliis elliptico-oblongis elongato-lanceolatisve acuminatis serrulatis, racemis terminalibus brevibus, pedunculo pubescente, pedicellis glaberrimis, bracteolis late ovatis acuminatis brevibus, calycibus baccatis immutatisve.—*DC. Prodr.* vii. 594; *Rich. Voy. Astrol.* 82. *t.* 30. (*Gunn*, 305.)

Hab. Common on the mountains throughout the Island, elev. 2–4000 feet.—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia (elev. 6000 feet), *Mueller*.

A small shrub, 3–5 feet high, sometimes, in sheltered localities, attaining 8 feet. (*Gunn.*) Conspicuous in February for the abundance of its snowy-white wax-like berries, which are said to be extremely beautiful.—*Stems* stout, woody, terete, covered with appressed or spreading rigid hairs. *Leaves* 1–3 inches long, $\frac{1}{3}$–$\frac{2}{3}$ broad, elliptical-oblong or narrow-lanceolate, very coriaceous, acuminate, sharply and finely toothed, shortly petioled, the petiole and midrib setose below. *Flowers* small, white, in 6–10-flowered, short, generally terminal racemes. *Peduncle* pubescent; pedicels glabrous, with three small concave coriaceous bracts at the base. *Calyx* deeply five-cleft, usually baccate in fruit, but not always so.

2. **Gaultheria lanceolata** (Hook. fil. in Lond. Journ. Bot. vi. 267); fruticulus pedalis, ramis ascendentibus fastigiatim ramulosis appresse setosis, foliis anguste lanceolatis acuminatis utrinque glaberrimis serrulatis, pedunculis solitariis axillaribus brevibus 3–4-bracteolatis, bracteolis obtusis, calyce baccato. (*Gunn*, 515.) (Tab. LXXII.)

Hab. Summit of Benlomond, the Western Mountains, etc., elev. 4000 feet, *Gunn*.—(Fl. Jan.)

A small species, intermediate in size between *G. antipoda*, var. *depressa*, and *G. hispida*.—*Stems* woody; branches a foot high, covered with appressed setæ. *Leaves* perfectly glabrous, $\frac{1}{2}$–1 inch long, narrow lanceolate, acuminate, serrulate, very thick and coriaceous. *Peduncles* solitary, stout, shorter than the leaves, bracteolate. *Flowers* small, white. *Calyx* baccate, red.—Plate LXXII. Fig. 1. flower; 2. corolla, laid open; 3. stamens; 4, ovary and hypogynous glands; 5, fruit:—*all magnified*.

3. **Gaultheria antipoda** (Forst. Prodr. 196); divaricatim ramosa, ramulis pubescenti-tomentosis et setulosis, foliis late ovatis oblongis lanceolatisve obtusis crenatis serratisve, floribus 5–6-meris axillaribus solitariis breve pedicellatis, pedicello pubescente bracteolato, calyce baccato v. immutato.—*Rich. et Less. Fl. N. Zeal.* 210. *t.* 28; *DC. Prodr.* viii. 594; *Hook. fil. Fl. N. Zeal.* i. 161.

Var. γ. *depressa*; fruticulus parvus depressus, foliis parvis late obovatis oblongis ellipticisve crenatis, calycibus fructiferis valde incrassatis.—*Nob. in Fl. N. Zeal. l. c.* G. depressa, *Nob. in Lond. Journ. Bot.* vi. 267. (*Gunn*, 516.) (Tab. LXXIII. A.)

Hab. Var. γ, summits of Mount Olympus, and of Benlomond, etc., *Gunn, Backhouse, Archer*.

Distrib. Lofty mountains of the Middle Island of New Zealand.

The common form of *Gaultheria antipoda* is a bushy shrub, 3–5 feet high, common on clay-hills in New Zealand, where it is an extremely variable plant. In the mountainous districts of the same archipelago it becomes dwarfed, and finally, in the alpine regions, it is reduced to a slender, prostrate, creeping plant, and it is this form alone that occurs in Tasmania. It thus affords a curious instance of the difficulty botanists often have in discovering what are species and what only varieties; for this was described by me as a different species before the mountain variety of the New Zealand *G. antipoda* was known; and no one, without a full suite of intermediate forms, could question its distinctness, nor indeed suspect it. Supposing New Zealand to be exposed to such a change of climate as to obliterate its mountain vegetation, the links would be lost between the Tasmanian and the common New Zealand states of *G. antipoda*.—A small, creeping, woody-stemmed shrub, with slender, prostrate, wiry branches; the branchlets pubescent, and covered with appressed bristles. *Leaves* alternate, small, $\frac{1}{3}$–$\frac{1}{2}$ inch long, shortly petioled, elliptical or obovate-oblong, blunt, crenate, the veins reticulate, glabrous on both surfaces, with a few bristles at the crenatures. *Flowers* axillary, solitary, shortly pedicelled. *Fruit* baccate, very fleshy, large for the size of the plant, $\frac{1}{2}$–$\frac{2}{3}$ inch across.—Plate LXIII. A. Fig. 1, leaf; 2, young fruit:—*both magnified.*

Gen. II. PERNETTYA, *Gaud.*

Calyx 5-partitus, persistens. *Corolla* ovata v. globosa, ore 5-dentato. *Stamina* 10, libera, inclusa; filamentis supra basin incrassatis; antherarum loculis muticis bi-aristatisve. *Ovarium* depresso-globosum; glandulis hypogynis 10, lobatis. *Stylus* brevis; stigmate sub-5-lobo. *Bacca* 5-locularis, loculis polyspermis.—Fruticuli *glabri v. setosi, erecti v. procumbentes;* foliis *alternis, persistentibus, coriaceis;* floribus *solitariis racemosisve, axillaribus, parvis, albis.*

This is almost exclusively a South American genus, the Tasmanian species being the only exception hitherto discovered, and that differs from the majority of its congeners in the anthers not having awns at the back, the South American *P. furens* alone presenting the same character. The Tasmanian species is a very small, creeping, woody, much branched, perfectly glabrous shrub.—*Branches* 2–3 inches long, slender, ascending. *Leaves* $\frac{1}{4}$–$\frac{1}{3}$ inch long, shortly petioled, spreading, elliptic-lanceolate, acute, very coriaceous indeed, obscurely serrate, shining. *Peduncles* solitary, axillary, shorter than the leaves, bracteate at the base. *Calyx*-lobes coriaceous, ovate, subacute. *Corolla* small, white, ovate or nearly globose; mouth five-toothed. *Anthers* small, oblong, bursting by large pores. *Ovary* surrounded with a five-lobed disc, five-celled. *Ovules* many, on axillary placentæ. *Berry* about the size of a pea, yellow or red or cream-coloured. (Named in honour of *Don Pernetty*, historiographer of Bougainville's Voyage to South America; and the name *Perandra* from πηρος, *hornless*, and ανηρ.)

1. **Pernettya (Perandra) Tasmanica** (Hook. fil. in Lond. Journ. Bot. vi. 268); humilis, depressa, divaricatim ramosa, ramulis puberulis, foliis patulis elliptico-lanceolatis acutis integerrimis v. obscure serrulatis, pedicellis axillaribus basi 3–4-bracteolatis, antheris muticis, ovario disco 5-lobo cincto. (*Gunn*, 708.) (Tab. LXXIII. B.)

Hab. On all the mountains, forming large green cushions, especially in a granite soil, *Backhouse, Gunn, etc.*—(Fl. Jan.)

Plate LXXIII. B. Fig. 1, leaf; 2, flower; 3, the same, laid open; 4, stamen; 5, calyx and ovary; 6, fruit:—*all magnified.*

Nat. Ord. XLIX. EPACRIDEÆ.

One of the most extensive and peculiar Natural Orders in Australia, though differing so little from *Ericeæ* as to be scarcely distinguishable, except by the unilocular anthers. When first defined (in Brown's Prodromus), the *Epacrideæ* were supposed to be confined to Australia and Polynesia; but they have since been found to extend over the Malayan Archipelago into the peninsula of that name, and the Philippine

Islands, and one species at least is a native of Chili. In habit and appearance the *Epacrideæ* remarkably imitate the *Ericeæ*, all being shrubs, none attaining a great size, and the majority being rigid, bushy plants, with evergreen, coriaceous leaves, inhabiting dry heathy tracts, and often conspicuous for the great beauty and abundance of their flowers. 140 species are described in Brown's Prodromus, published in 1810, and 214 in De Candolle's, to which upwards of 120 have since been added, chiefly from Swan River and South-eastern Australia and Tasmania; besides these, a considerable number remain undescribed in our Herbaria. As however considerable reductions must be made amongst the species of some genera, perhaps 300 will approximate to the number of known Australian species. Of these about 12 are almost exclusively tropical species, 170 inhabit the South-eastern, and 160 the South-western quarters of Australia; scarcely any are common to both these last areas. Of the genera, 14 are peculiar to the South-east, and 10 to the South-west quarters, and only 8 are common to both. As many as 10 genera, and about 40 species, are confined to Tasmania, and especially to the mountains of that Island; some of these extend to the mountains of Victoria.

Div. I. ***Ovules solitary. Fruit a berry or nut, with a fleshy or dry outer coat.*** (Gen. I.–X.)

Gen. I. STYPHELIA, *Sm.*

Calyx basi bracteatus; bracteis 4 v. pluribus. *Corollæ* tubus elongatus, basi intus fasciculis 5 villorum; limbi laciniæ revolutæ, barbatæ. *Filamenta* exserta. *Squamulæ* hypogynæ 5, rarius connatæ. *Drupa* subexsucca; putamine osseo, solido, 5-loculari.—Frutices *ramosi;* foliis *sparsis, breve petiolatis, mucronatis;* floribus *axillaribus, speciosis;* pedunculis 1–3-*floris.*

A genus of about twelve species, all but one natives of South-eastern Australia and Tasmania.—*Shrubs* with prostrate or erect branches, scattered, acuminate, shortly petioled leaves, and axillary 1–3-flowered peduncles. *Calyx* with four or more bracts. *Corolla* with a long tube, furnished at the base inside with five tufts of hairs, its reflexed lobes bearded. *Filaments* exserted. *Fruit* scarcely fleshy, with a five-celled enclosed nut: cells one-seeded. (Name from στυφελος, *rigid.*)

1. **Styphelia adscendens** (Br. Prodr. 537); caule prostrato, ramis diffusis adscendentibus, foliis planis margine ciliato-scaberulis lanceolatis pungenti-acuminatis subtus glaucis striolatis nervis 3–5 mediis parallelis lateralibus extus penniveniis, floribus solitariis axillaribus breve pedunculatis, bracteis late ovatis, sepalis submembranaceis ovatis subacutis, corollæ tubo $\frac{1}{3}$ breviore.—*DC. Prodr.* 735. (*Gunn*, 619.)

Hab. Dry pastures, etc., heaths near Hobarton and Circular Head; common.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia; Victoria, *Robertson;* Grampians, *Mueller.* (Introduced into England.)

A much branched, diffuse, rigid plant, forming matted patches a foot across.—*Stems* and branches prostrate, the latter ascending at the tips, leafy, wiry. *Leaves* $\frac{1}{3}$–$\frac{2}{3}$ inch long, imbricate, lanceolate, broadest above the middle, acuminate, with a slender, rigid, setose point; margins ciliolate; upper surface nerveless, lower striated and glaucous. *Flowers* solitary, sessile, reddish, longer than the leaves. *Calyx*-leaves rather membranous, ovate, subacute, shorter than the tube of the corolla. *Nut* oblong, very hard and woody, five-celled.

Gen. II. ASTROLOMA, *Br.*

Calyx basi bracteatus, bracteis 4 v. pluribus. *Corollæ* tubus ventricosus, calyce duplo longior, basi intus fasciculis 5 villorum; limbi laciniæ breves, barbatæ. *Filamenta* inclusa. *Discus* hypogynus cyathiformis. *Drupa* subexsucca; putamine osseo, solido, 5-loculari.—Frutices *humiles, sæpius diffusi;* foliis *sparsis, sæpe ciliatis;* floribus *axillaribus, erectis.*

About twenty species of this genus are known, chiefly natives of the South-west coast of Australia.—Small.

generally prostrate, wiry, rigid shrubs, with lanceolate, often pungent leaves, and solitary, axillary, sessile, erect flowers, which differ from those of *Stenanthera* in the included stamina and cyathiform disc. (Name from *αστρον, a star,* and *λωμα, a fringe.*)

1. **Astroloma humifusum** (Br. Prodr. 538); prostratum, ramosissimum, ramis ascendentibus, foliis linearibus lanceolatisve longe setaceo-acuminatis pungentibus ciliatis superne convexis subtus glaucescentibus striolatis, floribus axiliaribus sessilibus, calyce corolla $\frac{3}{4}$ longiore.—*DC. Prodr.* vii. 738; *Bot. Mag.* 1439; *Lodd. Bot. Cat.* 1554. Ventenatia humifusa, *Cav. Ic.* iv. 28. *t.* 348. (*Gunn,* 122.)

Hab. Abundant on sandy and stony heaths, etc.—(Fl. May, June.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to Victoria. (Introduced into England.)

A small, very much branched, prostrate, rigid, wiry, twiggy shrub.—*Stems* woody at the base; branches 6–10 inches long, ascending. *Leaves* erect or spreading, $\frac{1}{3}$–$\frac{1}{2}$ inch long, linear or linear-lanceolate, gradually tapering to a long, rigid, pungent apex; margins ciliated with stiff bristles; upper surface convex. *Flowers* about as long as the leaves. *Corolla* red; tube narrow. *Fruit* oblong, rather longer than the calyx.

Gen. III. STENANTHERA, *Br.*

Calyx basi multibracteatus. *Corolla* tubulosa, tubo calyce duplo longiore, ventricoso, intus nudo; limbo brevi, patente, semi-barbato. *Filamenta* inclusa, barbata, carnosa, antheris latiora. *Discus* hypogynus cyathiformis. *Drupa* subexsucca; putamine osseo, solido, 5-loculari; loculis 1-spermis.—*Fruticuli;* foliis *confertis, acerosis;* floribus *axillaribus, erectis.*

Only one species of this genus was known previous to the discovery of the *S. conostephioides* in the Grampians of Victoria, by the indefatigable and acute Dr. Mueller.—*S. pinifolia* is a rigid, woody, small shrub, with terete, erect or ascending branches, densely covered above with leaves, and below with small scars. *Leaves* slightly scaberulous, $\frac{1}{3}$ inch long, slender and acicular, with pungent, setose apices, a stout central rib at the back, and recurved margins. *Calyx* larger than the leaves, surrounded by many imbricate bracts. *Corolla* bright red, with a slender tube much longer than the calyx, ventricose above, naked within. *Filaments* included, broader than the anthers, fleshy. *Drupe* somewhat fleshy, enclosing a hard, five-celled, five-seeded nut, enveloped in the calyx, and much shorter than its leaflets. (Name from *στενος, narrow,* and *ανθηρ, anther.*)

1. **Stenanthera pinifolia** (Br. Prodr. 538); foliis angustissime acicularibus margine ad costam recurvis.—*DC. Prodr.* vii. 739; *Bot. Reg.* 218. Styphelia pinifolia, *Spreng. Syst.* i. 659. (*Gunn,* 1183.)

Hab. Circular Head, *Gunn;* Launceston? *Lawrence.*—(Fl. Oct.)

Distrib. South-eastern Australia, from Port Jackson to Victoria. (Introduced into England.)

Gen. IV. CYATHODES, *Lab.*

Calyx basi multibracteatus. *Corolla* infundibuliformis, tubo calycem æquante v. superante, intus nudo v. piloso, limbo patente, barba rara v. 0. *Filamenta* inclusa v. exserta. *Discus* hypogynus cyathiformis. *Drupa* baccata, 2–10-locularis; loculis 1-spermis.—Frutices *erecti, ramosi;* foliis *subtus striatis;* floribus *axillaribus, parvis, plerumque albis.*

This is one of the few extra-Australian genera of the Order, some species being found in New Zealand and the Pacific Islands. About ten are known to inhabit Australia and Tasmania, of which one only is found in the South-west quarter.—Small, woody, twiggy, Heath-like shrubs, with acerose leaves. *Flowers* small. *Calyx* surrounded with many imbricating bracts. *Corolla* funnel-shaped; limb naked or bearded. *Filaments* included or exserted. *Drupe* more or less fleshy, with a bony, five-celled, five-seeded nut, seated on a fleshy, cup-shaped disc. (Name from *κυαθος, a cup;* in allusion to the hypogynous disc.)

§ 1. *Corolla-lobes bearded.*

1. **Cyathodes glauca** (Lab. Fl. Nov. Holl. i. 57. t. 81); frutex ramulis virgatis, foliis interrupte confertis subverticillatis patentibus divaricatisve longe lineari-lanceolatis acuminatis mucronatisve supra convexis sulcatis subtus glaucis parallele striolatis, floribus versus apices ramulorum subconfertis, bracteis obtusis, corollæ lobis barbatis, filamentis paulo exsertis, drupa carnosa 8–10-loculari.—*Br. Prodr.* 539; *DC. Prodr.* vii. 740. (*Gunn,* 520.)

Hab. Common in mountainous parts of the Island, in woods, etc., elev. 1–3000 feet.—(Fl. Nov.) (*v. v.*) (Introduced into England.)

A slender, branched, straggling shrub, 2–6 feet high.—*Branchlets* pubescent. *Leaves* more or less fascicled and whorled, $\frac{1}{2}$–$1\frac{1}{2}$ inch long, slender, patent, acuminate or mucronate, grooved above when dry, striate and glaucous beneath. *Flowers* rather crowded in the axils of the terminal leaves, white, erect, with bearded corolla-lobes. —This species varies extremely in the length and breadth of the leaves, which are broadest when shortest.

2. **Cyathodes straminea** (Br. Prodr. 539); fruticulus robustus erectus v. decumbens, foliis interrupte subverticillatis patulis crasse coriaceis ovalibus oblongisve obtusis muticis subtus multinerviis nervis exaratis, floribus parvis, bracteis rotundatis, corollæ tubo calyce æquilongo, limbo barbato, drupa carnosa 5-loculari.—*DC. Prodr.* vii. 741. (*Gunn,* 1194).

Hab. Mount Wellington, elev. 4000 feet.—(Fl. Jan.) (*v. v.*)

A small, woody species, 6–10 inches high, with stout, terete stems, and woody, whorled branches.—*Leaves* fascicled and whorled, about $\frac{1}{3}$ inch long, very coriaceous, petioled, oblong or linear-oblong, blunt, the margins and tip often sphacelated, under surface glaucous, grooved, with many parallel nerves, the outer pair simple or penninerved towards the margin. *Flowers* smaller than in *C. glauca*, to which this is closely allied.

3. **Cyathodes macrantha** (Hook. fil.); fruticulus erectus ramosus, ramis robustis, ramulis tomentosis, foliis subfasciculatim verticillatis petiolatis lineari- v. elliptico-oblongis acutis apiculo obtuso superne concavis subtus glaucis nervis striolatis, floribus solitariis sessilibus, calycibus bracteisque obtusis, corollæ tubo calyce bis longiore lobis subbarbatis, tubo intus villoso. (*Gunn,* 1194 *anni* 1847.)

Hab. Sides of Mount Olympus, elev. 4000–4500 feet, *Gunn.*—(Fl. Jan.)

Very similar indeed to *C. straminea*, but larger, with the corolla at least three times as large, and having its tube more than twice the length of the calyx.

4. **Cyathodes dealbata** (Br. Prodr. 539); parvula, caulibus procumbentibus, ramis ascendentibus, foliis parvis sparsis subimbricatis petiolatis crasse coriaceis oblongis lineari-oblongisve obtusis mucronatis apice tabescente muticisve subtus niveis nervis 1–3 discoloribus, corollæ tubo intus piloso, limbi barbati lobis brevibus, drupa 2–5-loculari.—*DC. Prodr.* vii. 741. (*Gunn,* 1195.)

Hab. Summit of Mount Wellington, *Brown, Gunn.*—(Fl. Jan.) (*v. v.*)

Much the smallest Tasmanian species of the genus. Easily known by the small leaves, snow-white below.—*Stems* woody, prostrate, with numerous short, wiry, ascending, leafy branches, 3–8 inches long. *Leaves* not whorled nor fascicled, loosely imbricate, suberect, very coriaceous, $\frac{1}{5}$ inch long, petioled, with a stout midrib, and one or two pairs of dark veins, blunt, or with a deciduous mucro. *Flowers* small. *Corolla*-tube cylindrical, pilose internally; limb very short. *Drupe* small.

5. **Cyathodes ascendens** (Hook. fil. in Lond. Journ. Bot. vi. 267); caulibus robustis cylindricis prostratis, ramis robustis curvatis ascendentibus foliosis, foliis imbricatis suberectis petiolatis valde coriaceis elliptico-ovatis mucronatis pungentibus subtus glaucescentibus multistriatis apice sphacelatis, bracteis sepalisque late ovato-rotundatis obtusis ciliatis striatis, corollæ tubo brevi intus piloso, limbi lobis brevibus dense barbatis, drupa 5-loculari. (*Gunn,* 299.) (Tab. LXXIV. *A.*)

Hab. Summit of Mount Wellington, *Gunn.*—(*v. v.*)

A stout, woody species, with long, terete, ascending branches, 6–8 inches long, covered uniformly with laxly imbricating leaves.—*Leaves* elliptic-ovate, mucronate, very glaucous below, and there striated with many nerves, their tips brown and withered. *Bracts* and *sepals* blunt, ciliate, striate, broadly ovato-rotundate. *Tube of corolla* short, hairy within, its lobes densely bearded.—Plate LXXIV. *A.* Fig. 1, front, and 2, back view of leaf; 3, flower; 4, corolla laid open; 5, stamen:—*all magnified.*

6. **Cyathodes divaricata** (Hook. fil.); fruticulus erectus ramosus rigidus, foliis petiolatis squarroso-patentibus rigidis aciculari-subulatis pungenti-acuminatis acerosisve marginibus recurvis glabris scaberulisve subtus glaucis nervis simplicibus, pedunculis elongatis multibracteolatis, bracteolis interdum infra calycem deficientibus, calyce obtuso corolla $\frac{1}{2}$ breviore, corollæ lobis glabris subbarbatisve, drupa baccata, nuce osseo.—Lissanthe divaricata, *Nob. in Lond. Journ. Bot.* vi. 267. (*Gunn,* 618.) (Tab. LXXIV. *B.*)

Hab. Foot of Mount Wellington and other hills near Hobarton; Swan Port, *Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia, *Mueller.*

Intermediate between *Cyathodes* and *Lissanthe*, the habit being that of *L. strigosa* and *C. Oxycedrus*, which it strongly resembles; but the tube of the corolla is longer, and the limb is more or less bearded; the peduncles are covered with small, imbricating bracts, which sometimes sheath the base of the calyx, and at others stop short some way below the calyx (as in *Lissanthe*), so that the latter is then quite ebracteate.—*Plant* rigid, 1–2 feet high, erect, branched; branches woody. *Leaves* $\frac{1}{3}$–$\frac{1}{2}$ inch long, patent and somewhat squarrose, very rigid, pungent, subulate or lanceolate-subulate or acicular, their margins recurved; under surface glaucous, with three to five parallel, simple nerves. *Flowers* numerous, nodding or pendulous, on small, curved pedicels, white. *Corolla* twice as long as the broad, blunt sepals.—Plate LXXIV. *B.* Fig. 1, front, and 2, back view of leaf; 3, flower, bracts, and leaf; 4, corolla laid open; 5, stamen; 6, fruit:—*all magnified.*

§ 2. *Corolla-lobes quite glabrous.*

7. **Cyathodes parvifolia** (Br. Prodr. 540); frutex erectus fastigiatim ramosus, ramulis puberulis, foliis subsquarroso-patentibus petiolatis parvis (semi-uncia brevioribus) lanceolato-subulatis aceroso-acuminatis rigidis pungentibus brevissime ciliatis subtus glaucis 3–5-nerviis, nervis omnibus simplicibus, floribus nutantibus, corolla calyce obtuso bis longiore, limbo imberbi, drupa baccata, nuce osseo.—*DC. Prodr.* vii. 741. (*Gunn,* 519.)

Hab. Abundant, especially in hilly parts of the Island, ascending to 3000 feet.—(Fl. Nov.) (*v. v.*)

A rigid, subsquarrose, pungent shrub, 2–4 feet high, with woody stems, fascicled branches, and small white pendulous flowers.—*Leaves* patent, rigid, oblong-lanceolate, linear-lanceolate, or subulate, petioled, $\frac{1}{4}$–$\frac{1}{3}$ inch long, acuminate, acerose, and pungent, scaberulous above, glaucous below, with two to five slender, simple nerves. *Drupes* numerous, red, fleshy, with a bony five-celled nut.—Easily distinguished from *C. Oxycedrus* by the much smaller foliage.

8. **Cyathodes Oxycedrus** (Br. Prodr. 541); frutex erectus fastigiatim ramosus, ramis erectis divaricatisve, foliis subsquarroso-patentibus deflexisve (semi-uncia longioribus) lanceolato-subulatis rigidis pungenti-acuminatis margine glabris subtus glaucis 3–5 nerviis, nervis omnibus simplicibus, floribus breve pedunculatis, calyce obtuso tubo corollæ paulo breviore, corollæ lobis glabris, drupa baccata, nuce osseo.—*DC. Prodr.* vii. 741; *Fl. N. Zeal.* i. 164. Styphelia Oxycedrus, *Lab. Fl. Nov. Holl.* i. 49. *t.* 69. (*Gunn,* 713, 714, 1184, 2030.)

Hab. Not uncommon in various parts of the Colony, as at Circular Head, Woolnorth, Marlborough, and Recherche Bay, ascending to 3000 feet, *Gunn,* etc.—(Fl. Oct.)

Distrib. New Zealand. (Introduced into England.)

Very similar indeed to *C. parvifolia*, but a much taller shrub, 5–8 feet high; and the leaves are considerably larger and longer, and perfectly glabrous, and the tube of the corolla is shorter; it is hence intermediate between *C. parvifolia* and *C. divaricata*.—*Leaves* $\frac{1}{2}$–$\frac{2}{3}$ inch long, very rigid and pungent, patent and reflexed. *Flowers* small, white. *Berries* generally red, rarely white, produced in great abundance, giving the plant a very beautiful appearance.

9. **Cyathodes abietina** (Br. Prodr. 540); fruticosa, robusta, ramis crassis, ramulis puberulis, foliis confertis imbricatis erectis lineari-lanceolatis acuminatis (apice non pungente) subtus nervis 5–7 simplicibus, pedunculis multi-bracteolatis, corollæ tubo calyce duplo longiore limbo intus puberulo, drupis baccatis, nuce osseo.—*DC. Prodr.* vii. 747. Styphelia abietina, *Lab. Fl. Nov. Holl.* i. 48. *t.* 68. (*Gunn*, 1185.)

Hab. Near the sea, on the south and west coasts; D'Entrecasteaux Channel, *Labillardière*, *Gunn*.

A very handsome species, of which I have seen but two specimens, gathered by Gunn in full fruit, and with withered fallen flowers entangled amongst the imbricating leaves.—Apparently a large bush, with very rigid, woody, stout branches and branchlets, the latter pubescent. *Leaves* $\frac{1}{2}$–$\frac{2}{3}$ inch long, flat, linear-lanceolate, ending in a rigid, cartilaginous, acuminate apex, which however is not pungent; margins cartilaginous; nerves beneath numerous, parallel, simple. *Flowers* small, white. *Calyx* obtuse, about half as long as the corolla. *Lobes of corolla* pubescent inside. *Berries* large, red.

Gen. V. LISSANTHE, *Br.*

Calyx bibracteatus v. ebracteatus. *Corolla* infundibuliformis, limbo imberbi. *Discus* hypogynus cyathiformis. *Drupa* baccata; putamine osseo, 5- (abortu 1–4-) loculari.—Frutices *rigidi*; foliis *sparsis, sæpius acerosis pungentibusve, subtus lineatis*; floribus *parvis*.

This genus, of which about ten Australian species are known, hardly differs from *Cyathodes*, except in the bracts of the peduncle being removed from the base of the calyx. *Cyathodes divaricata* seems to unite these genera. Some species have racemose flowers. (Name from λισσος, *smooth*, and ανθος, *a flower*.)

1. **Lissanthe strigosa** (Br. Prodr. 540); fruticulus erectus rigidus, ramulis pubescentibus glabrisve, foliis sparsis patentibus rigidis lineari-subulatis acuminato-pungentibus, racemis brevibus axillaribus, pedicellis basi bracteolatis, calyce ebracteato, corollæ tubo intus villoso.—*DC. Prodr.* vii. 742. Styphelia strigosa, *Smith, Pl. Nov. Holl. t.* 48. (*Gunn*, 518, 710, 711.)

Hab. Abundant throughout the Island, in dry clayey and gravelly places.—(Fl. Oct.) (*v. c.*)

Distrib. South-eastern Australia, from Port Jackson to Victoria. (Introduced into England.)

This is a very common and rather variable plant, with which I am inclined to unite Brown's *L. subulata*; its fruit is eatable.—A small rigid shrub, 6 inches to 2 feet high. *Branches* erect, pubescent or glabrous. *Leaves* erect or patent, $\frac{1}{3}$ inch long, subulate-lanceolate, rigid, acuminate with long, pungent, acicular points, glaucous beneath, with a thick midrib, and slender, parallel lateral veins. *Flowers* 2–4, in short axillary racemes, white or pink. *Calyx* very small, not one-sixth the length of the corolla, ebracteate, the pedicels bracteate at the base. *Tube* of the corolla villous internally, its lobes very short, triangular.

2. **Lissanthe montana** (Br. Prodr. 540); fruticulus erectus, foliis oblongo-linearibus obtusis muticis subtus glaucis, nervis omnibus simplicibus v. extimis extus penninerviis marginibus tenuibus, spicis brevibus axillaribus paucifloris, calyce bibracteato corollæ breviter urceolatæ tubo æquilongo, corollæ tubo intus lobisque glaberrimis, drupa parva exsucca. (*Gunn*, 313, 1196.)

Hab. Towards the summit of Mount Wellington, and other mountains.—(Fl. Dec.) (*v. r.*)

Distrib. Mountains of Victoria, *Mueller*.

A small, erect, fastigiate shrub, 2–6 inches high, so similar to *Leucopogon Hookeri* that it is difficult to distinguish them.—*Leaves* imbricating, erect, $\frac{1}{4}$ inch long, linear-oblong, blunt, with often thin, almost membranous

margins, glaucous below, with several parallel nerves, the outer sometimes branching towards the margin. *Flowers* very small, crowded two or four together on very short axillary racemes or spikes. *Calyx* bibracteate, obtuse. *Corolla* urceolate, very short, its tube and limb glabrous. *Fruit* fleshy, large, white, transparent.—Mueller sends a South Australian variety covered with a hoary pubescence.

3. **Lissanthe daphnoides** (Br. Prodr. 541); fruticulus strictus erectus, foliis elliptico- v. oblongo-lanceolatis concaviusculis mucrone calloso brevissimo v. nullo marginibus nudis v. subciliatis dorso inter nervos exaratis, floribus axillaribus solitariis, calyce obtuse bibracteato, tubo corollæ infundibuliformi calyce ter longiore fauce villosa limbo glabro.—*Lodd. Bot. Cat. t.* 466. Styphelia daphnoides, *Smith, Nov. Holl. p.* 48.

Hab. Tasmania, *Brown, Scott.*

Distrib. South-eastern and South-western Australia. (Introduced into England.)

An erect, sparingly branched shrub, with rather stout, elongate branches, and pubescent branchlets.—*Leaves* scattered, erect, $\frac{1}{4}$—$\frac{1}{3}$ inch long, elliptical or oblong or elliptical-lanceolate, glabrous or pubescent, blunt or with a small blunt apiculus, under surface veined, grooved between the veins, the three central nerves parallel, the rest branching to the margin. *Flowers* axillary, solitary, almost sessile, small, white. *Calyx* small, blunt, bibracteate, one-sixth the length of the tube of the corolla. *Lobes* of the corolla short, glabrous; throat bearded.—*L. Cunninghami*, DC., appears to be a variety of this species.

4. **Lissanthe ciliata** (Br. Prodr. 541); fruticulus erectus v. prostratus, foliis erecto-patentibus elliptico- v. oblongo-lanceolatis planis acuminatis pungentibus marginibus glabris ciliatisve subtus nervis lateralibus penninerviis, floribus axillaribus solitariis subsessilibus calyce acuto corollæ tubo $\frac{1}{2}$ breviore, corolla breviuscula, limbo glabro v. subbarbato. (*Gunn*, 523 *in part*, 1986.)

Hab. Northern parts of the Island: Rocky Cape, Georgetown, and Launceston, *Gunn.*—(Fl. Nov.)

Distrib. Grampian Mountains, Victoria, *Mueller.* (Introduced into England.)

This species closely resembles *L. daphnoides*, but may be readily distinguished by the shorter, more procumbent stems and ascending branches, the pungent apices to the leaves, the acute calyx-lobes, and much shorter corolla, which has a nearly glabrous or villous limb; from the latter character it seems to unite *Lissanthe* with *Leucopogon*.

Gen. VI. LEUCOPOGON, *Br.*

Calyx 2- rarius 3–4-bracteatus. *Corolla* infundibuliformis, limbo patente dense barbato. *Filamenta* inclusa v. subexserta. *Discus* hypogynus cyathiformis (rarius 0), 5-lobatus v. 5-partitus. *Drupa* sicca v. subbaccata; putamine 1–5-loculari, loculis 1-spermis.—Frutices *ericoidei;* foliis *sparsis, subconfertis, imbricatisve;* floribus *axillaribus terminalibusve, subsolitariis v. in racemos breves dispositis, albis.*

One of the largest and most abundant Australian genera, whose species cover wide tracts of land with a Heather-like vegetation. Upwards of 120 species are known, of which about 40 are found in the South-eastern quarter, 70 in the South-western, 10 in the Tropics, and six or seven are common to the South-eastern and South-western coasts. A very few species are also found in New Zealand and the mountains of the Malay Islands, and one in the Malay Peninsula.—*Shrubs* rarely tall, though sometimes 6–8 feet high, usually low and Heath-like, with small, white flowers, and small, persistent, rigid leaves. *Flowers* in axillary or terminal, short, few-flowered racemes, or almost sessile, conspicuous for the tuft of white down on the lobes of the corolla. *Calyx* with two or rarely three bracts at its base, its sepals blunt or acute. *Corolla* tubular or funnel-shaped. *Stamens* included or slightly exserted, seated at the mouth of the corolla. *Disc* cup-shaped, five-lobed. *Ovary* five-celled; cells one-ovuled. *Fruit* a coriaceous or crustaceous, one- to five-celled nut, with generally a very scanty, fleshy epicarp. (Name from λευκος, *white*, and πωγων, *a beard.*)

§ 1. *Spikes axillary, many-flowered. Drupe baccate.*

1. **Leucopogon Richei** (Br. Prodr. 541); frutex erectus glaberrimus, foliis suberectis (1–1½-uncialibus) oblongo- v. lineari-lanceolatis supra medium paulo latioribus acuminatis marginibus subrecurvis, spicis erectis multifloris, drupa parva 3–5-loculari baccata.—*DC. Prodr.* vii. 744; *Hook. Bot. Mag. t.* 3251. L. parviflorus, *Lindl. Bot. Reg. t.* 1560; *DC. l. c.* L. polystachyus, *Lodd. Bot. Cab. t.* 1436, *non Br. Prodr.* Styphelia Richei, *Lab. Fl. Nov. Holl.* i. 44. *t.* 60. S. parviflora, *Andr. Bot. Rep.* 287. S. Gnidium, *Vent. Hort. Malm. t.* 23.

Var. *α*; erecta, ramis erectis subfastigiatim ramosis. (*Gunn*, 429.)

Var. *β. parviflora*; minor, floribus foliisque paulo minoribus, caule interdum decumbente.—L. parviflorus, *Lindl. Bot. Reg.* 1560; *DC. l. c.* (*Gunn*, 1981.)

Var. *γ*; ramis patulis decumbentibusve, foliis lanceolatis.—L. affinis, *Br. Prodr.* (*Gunn*, 851.)

Hab. Var. *α.* and *β.* Abundant on sand-hills on all the coasts. Var. *β.* Flinders' Island, etc. Var. *γ.* In marshy spots, Circular Head, Woolnorth, etc.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern and South-western Australia, from New South Wales to Swan River. (Introduced into England.)

A very pretty, evergreen bush, 4–8 feet high, with erect, or rarely decumbent, and somewhat fascicled branches. *Leaves* ½ inch long and upwards, lanceolate, variable in breadth, broader above the middle, acuminate; margins a little recurved; under surface whitish, with three to five obscure, parallel, median nerves, which branch to the margins. *Flowers* very small, in white spikes, as long as or shorter than the leaves; rachis glabrous or puberulous. *Drupe* white, three- to five-celled, fleshy.—*L. parviflorus*, which is Brown's *L. affinis* in part, does not seem to differ in any respect, except the rather smaller flowers, from some of my Tasmanian specimens of *L. Richei*. Brown's *L. affinis* Gunn sends as a variety that grows amongst other and taller shrubs.

2. **Leucopogon australis** (Br. Prodr. 341); frutex erectus glaberrimus, ramis apice præsertim ramosis, foliis erectis appressis (1½–2-uncialibus) lineari-lanceolatis marginibus recurvis v. revolutis apice fuscescente obtuso v. acuminato, spicis erectis folio æquilongis brevioribusve, nuce parva depressa globosa 4–5-loculari.—*DC. Prodr.* vii. 744. (*Gunn*, 521.)

Hab. In poor soil, generally near the sea; Circular Head, Georgetown, Hampshire Hills, etc., *A. Cunningham, Gunn.*—(Fl. Oct., Nov.)

Distrib. South coast of Australia: Victoria, to King George's Sound.

A very fine species, resembling closely *L. Richei*, but with much longer and proportionally narrower, very pale green leaves, often strongly recurved at the margins, more numerous nerves, longer and more numerous spikes, and smaller, depressed, globose berries. The branches are very strict, erect, and fastigiate; the leaves are usually terminated with a brown, fuscous, blunt or acute tip. *Fruit* white.—The whole plant, when drying, smells of new-made hay.

§ 2. *Spikes axillary and terminal, three- or more-flowered. Calyx and bracts coloured. Drupe nearly dry. Leaves not cordate at the base.*

3. **Leucopogon virgatus** (Br. Prodr. 543); fruticulus, ramulis erectis divaricatisve tenuibus glaberrimis apicibusve puberulis, foliis (¼–½-uncialibus) appressis patulisve lineari-lanceolatis apice attenuatis rigidis acutissimis concavis margine ciliatis, spicis subaggregatis terminalibus axillaribusque paucifloris.—*DC. Prodr.* vii. 748. Styphelia virgata, *Lab. Nov. Holl.* i. 46. *t.* 64. (*Gunn*, 191, 712.)

Hab. Abundant in dry gravelly and sandy places throughout the Island.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern and South-western Australia, from Port Jackson to Swan River. (Introduced into England.)

A small, sparingly branched, twiggy species, 6–18 inches high.—*Branches* slender, erect or spreading, glabrous or puberulous towards the tips. *Leaves* appressed or spreading, scattered or imbricating, $\frac{1}{4}$–$\frac{1}{2}$ inch long, concave, subulate or ovate-lanceolate, narrowed to a long pungent point, glabrous or ciliated. *Flowers* small, in few-flowered, short spikes, which are axillary, and often crowded towards the ends of the branches. *Bracts* and *sepals* acute. *Fruit* very small.

4. **Leucopogon ericoides** (Br. Prodr. 543); fruticulus erectus, foliis lineari-oblongis linearibusve suberectis patentibusve obtusis acutiusculisve pungenti-mucronatis margine recurvis revolutisve, spicis secus ramulos axillaribus 3–5-floris folio brevioribus, drupa exsucca angulata.—*DC. Prodr.* vii. 747. Styphelia ericoides, *Smith, Pl. Nov. Holl. t.* 48. Epacris spuria, *Cav. Ic.* iv. 27. *t.* 347. *f.* 1.

Var. *α*; ramulis foliis drupisque glaberrimis. (*Gunn,* 196, 1982, 1983.)

Var. *β*; ramulis foliis drupisque plus minusve puberulis scaberulis pubescentibusve.—L. trichocarpus, *Br. Prodr.* 543. Styphelia trichocarpa, *Lab. Nov. Holl.* i. 47. *t.* 66. (*Gunn,* 361, 1201, 1186.)

Hab. Very abundant throughout the Island, in dry heaths, etc. Var. *α*. In poor sandy and marshy soil, Georgetown, Flinders' Island, and Macquarrie Harbour. Var. *β*. Dry sandy soil near the sea at Georgetown, New Norfolk, etc.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to Victoria. (Introduced into England.)

A common, variable, and very pretty plant, which may readily be known from its allies by its linear or linear-oblong leaves, which often turn blackish in drying, with revolute margins, terminated with a pungent, long or short mucro, arising from a blunt or acute apex, and by the spikes being produced so abundantly from the axils of the leaves, that the twiggy branches look like long, compound spikes of inflorescence. The branches, rachis, and even fruit, are sometimes pubescent, at others quite glabrous.—*Stems* generally erect, of var. α 6 feet, and of var. *β* 1–3 feet high. *Leaves* usually patent, $\frac{1}{3}$–$\frac{2}{3}$ inch long, sometimes when short almost as broad as long, but always preserving their linear-oblong form.

5. **Leucopogon collinus** (Br. Prodr. 543); fruticulus erectus v. ramis decumbentibus foliisque glaberrimis puberulisve, foliis erectis imbricatis patentibusve linearibus lineari-oblongisve subacutis muticis apiculo sphacelato marginibus revolutis ciliato-denticulatis, spicis brevibus ramulos terminantibus.—L. collinus, *β*, *DC. Prodr.* vii. 748. Styphelia collina, *Lab.? Nov. Holl.* i. 47. *t.* 65.

Var. *α*; 2–3-pedalis, foliis $\frac{1}{2}$-uncialibus ciliato-denticulatis. (*Gunn,* 1191, 211, 34.)

Var. *β*; 1–2-pedalis, foliis late oblongis brevibus $\frac{1}{4}$-pollicaribus. (*Gunn,* 1190.)

Var. *γ*; 1–2-pedalis, foliis anguste oblongis $\frac{1}{4}$-pollicaribus squarroso-patentibus. (*Gunn,* 1188, 1189.)

Hab. Abundant throughout the Island, in dry, gravelly places, etc. Var. *α*. Circular Head and Georgetown. Var. *γ*. Abundant near Hobarton.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia. (Introduced into England.)

This again closely resembles both *L. virgatus* and *L. ericoides* in general appearance, but is very distinct from both, differing from *L. virgatus* in the leaves not being concave and narrowed into a pungent point, and from *Ericoides* in the spikes being crowded at the ends of short branches, and the leaves not being terminated with a pungent mucro; from the two following species it is not so easily distinguished, and I suspect its smaller forms pass into these. De Candolle considers Brown's *L. collinus'* to be a different variety, and possibly species, from Labillardière's (and makes of it his var. *Brownii*), distinguished by the margins of the leaves being recurved and less ciliated; it is hence possible that A. Cunningham's *L. ciliatus*, may be Labillardière's *L. collinus;* but as I have little doubt that these are varieties of one plant (of which that with recurved leaves is the ordinary form), I hesitate to change the existing nomenclature.—*Plant* glabrous or slightly pubescent on the branches and leaves. *Branches* generally bright red. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ inch long, linear-oblong, with recurved margins, and blunt or acute, sphacelated tips, their margins always denticulate and more or less ciliated, patent or appressed.

6. **Leucopogon ciliatus** (A. Cunn. in DC. Prodr. vii. 747); fruticulus, ramis suberectis decumbentibusve, foliis parvis ellipticis elliptico-oblongisve acuminatis muticis planis utrinque glabris ciliatis, spicis subsolitariis terminalibus 4–8-floris.—L. petiolaris, *DC.? l. c.* 753. L. collinus, *a*, Billardieri, *DC.? l. c.* Styphelia collina, *Lab.? Nov. Holl.* i. 47. *t.* 65. (*Gunn*, 852, 1191.)

Var. *α*; robusta, ramis erectis, spicis plurimis multifloris. (*Gunn*, 852, 1191.)

Var. *β*; minor, ramis gracilibus brevibus decumbentibus, foliis elliptico-ovatis interdum longe ciliatis, spicis brevibus paucifloris. (*Gunn*, 1192, 1984, 2048.) (Tab. LXXV. *A*.)

Hab. Var. *a*. Not uncommon in various parts of the Colony: Hobarton, *A. Cunningham*; Bass' Straits, *Bynoe*; Macquarrie Harbour, *Milligan*; Huon River, Recherche Bay, and Rocky Cape, *Gunn*. Var. *β*. Alpine situations, Chilton Hills, Lake St. Clair, Surry Hills, summit of Western Mountains, etc., *Gunn*.—(Fl. Oct.–Dec.) (*v. v.*)

Distinguished from *L. collinus* (of which I suspect it may be a variety) by the much smaller size, suberect or decumbent habit, comparatively longer spikes, and smaller leaves, which are erect, less than ¼ inch long, flat, without recurved margins, and elliptical or elliptical-ovate. The var. *β* is a mountain form, with straggling, almost prostrate, slender branches, and solitary spikes at their ends.—Plate LXXV. *A*. Var. *β*. Fig. 1 and 2, back and front view of leaves; 3, flower; 4, the same laid open; 5, stamens:—*all magnified.*

7. **Leucopogon Hookeri** (Sonder in Linnæa, xxvi. 248); fruticulus erectus subfastigiatim ramosus, foliis suberectis brevibus oblongis lineari-oblongisve utrinque obtusis muticis planis marginibusve recurvis subtus glaucis 3–5-nerviis, spicis ad apices ramulorum subfasciculatis erectis 3–5-floris, calycibus obtusis tubo corollæ æquilongis, drupis parvis depresso-sphæricis.—L. obtusatus, *Nob. in Lond. Journ. Bot.* vi. 269. (*Gunn*, 197, 854 *in part*, 1197.) (Tab. LXXV. *B*.)

Hab. Abundant in alpine situations throughout the Island.—(Fl. Nov.) (*v. v.*)

Distrib. Mountains of Victoria, *Mueller*.

So similar to *Lissanthe montana* that it is not readily distinguished from that plant, except by the bearded lobes of the corolla and the small fruit; it also most closely resembles *Leucopogon Colensoi* of New Zealand, but that has also a baccate fruit.—A small shrub, 6–16 inches high, with stout, erect, woody, much and fastigiately branched stems. *Branches* slender, often pubescent at the apices. *Leaves* small, ¼–⅓ inch long, linear-oblong or oblong, sometimes rather broader above the middle, coriaceous, blunt at both ends, rather thickened at the apex, and with cartilaginous margins, flat or with recurved margins, quite glabrous or minutely scaberulous and ciliated, below glaucous, with three to five nerves, the outer pair branching towards the margins. *Spikes* fascicled near the ends of the branches, erect, three- to five-flowered. *Flowers* small. *Sepals* short, broad, blunt, as long as the tube of the corolla. *Drupes* small, having a pleasant, nutty flavour (*Gunn*).—Plate LXXV. *B*. Fig. 1 and 2, back and front view of leaves; 3, flower; 4, the same laid open; 5, stamens:—*all magnified.*

§ 3. *Flowers solitary, axillary, sessile. Calyx four-bracteate.*

8. **Leucopogon Frazeri** (A. Cunn. in Ann. Nat. Hist. ii. 47); parvulus, erectus v. ascendens, ramulis paucis gracilibus puberulis, foliis oblongo-lanceolatis lineari-oblongisve longe pungenti-acuminatis planis subtus striato-nervosis marginibus ciliolatis, floribus axillaribus solitariis, calycibus tenuiter ciliatis 4-bracteatis tubo corollæ ¼–½ brevioribus, disco profunde 5-lobo, styli basi villoso.—*Fl. N. Zeal.* i. 164. L. nesophilus, *DC. Prodr.* vii. 752. L. Bellignianus, *Raoul, Choix de Plantes Nouv. Zél.* 18. *t.* xii. L. Stuartii, *F. Mueller, MSS.; Sonder in Linnæa*, xxvi. 249. Pentachondra mucronata, *Nob. in Lond. Journ. Bot.* vi. 270. (*Gunn*, 709.)

Hab. Hampshire Hills and mouth of the Detention River, *Gunn*; summit of Grass-tree Hill, near Hobarton, and banks of Lake Echo.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. Victoria: Mount Wellington, *Mueller;* New Zealand.

Very unlike any of the preceding species, and easily recognized by its small size, and large, solitary, axillary flowers. I had long considered it to be specifically different from the New Zealand *L. Frazeri*, but find that the characters I distinguished these by, namely the venation of the leaves and length of the corolla, are not constant. —A very small species, 4–8 inches high, with slender, wiry, prostrate stems, and erect or ascending branches, 2–3 inches long. *Leaves* scattered, loosely imbricated, $\frac{1}{3}$ inch long, $\frac{1}{4}$ broad, coriaceous, flat, lanceolate or oblong-lanceolate, with a very long, pungent, acuminate point. *Sepals* oblong, blunt, twice as long as the ovate bracts, and only half as long as the tube of the corolla. *Corolla* erect, as long as the leaves. *Drupe* three- to five-celled.

Gen. VII. MONOTOCA, *Br.*

Calyx 2-bracteatus. *Corolla* infundibuliformis, limbo fauceque imberbibus. *Discus hypogynus* cyathiformis. *Ovarium* 1-loculare, 1-ovulatum. *Drupa* baccata.—Frutices *v.* arbusculæ; foliis *sparsis;* spicis *axillaribus terminalibusque, pauciflоris;* floribus *parvis, albis, interdum defectu organorum dioicis.*

This is another small genus of *Epacrideæ*, very closely allied to *Leucopogon*, but differing in the glabrous corolla, and structure of the ovary, which is one-celled only, and the drupe consequently is only one-seeded. The species, of which there are about eight, are all confined to extratropical Australia, and so closely resemble *Leucopogon* that it is difficult to discriminate them without dissecting the ovary. (Name from μονος, *one*, and τοκος, *a birth;* in allusion to the one-ovuled ovary.)

1. **Monotoca lineata** (Brown, Prodr. 547); arbuscula, ramulis gracilibus puberulis, foliis patentibus rigidis obovatis oblongis lineari-oblongis linearibusve acutis acuminatisve pungentibus subtus glaucis multinerviis planis marginibusve recurvis, spicis nutantibus axillaribus folio multoties brevioribus, rachi puberula, bracteis deciduis, floribus minimis.—*DC. Prodr.* vii. 755. Styphelia glauca, *Lab. Nov. Holl.* i. 45. *t.* 61. (*Gunn*, 300, 1198.)

Hab. Abundant on the skirts of damp forests, etc.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia: Victoria, *Mueller.* (Introduced into England.)

A large shrub or small tree, 5–15 feet high, with slender, spreading branches, and puberulous branchlets, varying a good deal in habit.—*Leaves* exceedingly variable in size and figure, $\frac{2}{3}$–$1\frac{1}{4}$ inch long, $\frac{1}{6}$–$\frac{1}{3}$ inch broad, linear, linear-oblong, oblong-lanceolate, or obovate-oblong, acuminate with a pungent mucro, glaucous below, with many parallel nerves. *Spikes* axillary, very short, nodding, two- to five-flowered. *Flowers* minute, often unisexual. *Sepals* very broad, blunt. *Drupe* oblong, rather fleshy.

2. **Monotoca empetrifolia** (Br. Prodr. 547); fruticulus, caule prostrato ramoso, ramis adscendentibus, foliis divaricatis reflexisve ovali-oblongis mucronatis valde coriaceis convexis marginibus recurvis subtus glaucis, spicis axillaribus nutantibus 2–3-floris, bracteis persistentibus, floribus hermaphroditis.—*DC. Prodr.* vii. 756. (*Gunn*, 715 *et* 814.)

Hab. Not uncommon on the loftier mountains, elev. 3–5000 feet, as on Mount Wellington and at Lake St. Clair.—(Fl. Nov.) (*v. v.*)

A small species, 12–18 inches high, with prostrate, woody stem, and short, ascending branches, 4–8 inches high, the branchlets pubescent.—*Leaves* patent or deflexed, small, short, very convex, deep green, shining, $\frac{1}{4}$ inch long, linear-oblong, with a rigid, pungent mucro, glaucous below, nerveless or with three to five stout nerves. *Spikes* short, nodding, two- or three-flowered. *Bracts* persistent. *Flowers* rather larger than in *M. lineata*. *Drupes* like those of *M. lineata*.

Gen. VIII. ACROTRICHE, *Br.*

Calyx 2-bracteatus. *Corolla* infundibuliformis, limbi lobis apice barba deflexa. *Discus* cyathiformis,

sublobatus. *Drupa* subbaccata; putamine 5-loculari, celluloso.—Frutices *humiles, ramosissimi*; ramis *sæpius divaricatis*; foliis *sparsis, plerisque speciebus mucronatis*; spicis *lateralibus axillaribusque, brevibus*; floribus *parvis, albis.*

Acrotriche is a small genus of *Epacrideæ*, very closely allied to, and altogether resembling, *Leucopogon* and *Monotoca*, but differing in the cellular nut of the drupe and in the lobes of the corolla, being neither villous, as in *Leucopogon*, nor naked, as in *Monotoca*, but furnished with a deflexed pencil of hairs. About nine species are known, of which most are natives of the south-western quarter of the continent. (Name from *ακρος, a point*, and *θριξ, a hair.*)

1. **Acrotriche serrulata** (Br. Prodr. 547); fruticulus humilis, caule prostrato, ramis ascendentibus, foliis patulis lanceolatis vel anguste lineari-lanceolatis longe cuspidato-acuminatis et pungentibus glabris pilosisve subtus pallidis costa valida marginibus ciliato-serrulatis lævibusve, spicis axillaribus v. e lapsu foliorum rameis folio æquilongis 3–8-floris.—*DC. Prodr.* vii. 757. Styphelia serrulata, *Lab. Nov. Holl.* i. 45. *t.* 62. (*Gunn*, 192.)

Hab. Common on dry hills throughout the Colony.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia.

A small, spreading shrub, 6–12 inches high, with a short, prostrate, woody stem, ascending branches, and puberulous branchlets.—*Leaves* patent, so acerose and pungent that the plant is not to be grasped with impunity; very rigid, $\frac{1}{4}$–$\frac{1}{3}$ inch long, lanceolate or narrow linear-lanceolate, attenuated into a fine, long, pungent apex, serrulate or smooth on the margins, glabrous or hairy; under surface pale, with a stout midrib. *Spikes* axillary, and on the branches below the leaves, patent, three- to eight-flowered, about as long as the leaves. *Sepals* blunt, half as long as the tube of the corolla. *Drupes* very small, hardly succulent, with a spongy endocarp.

2. **Acrotriche patula** (Br. Prodr. 547); fruticulus, caule prostrato, ramis divaricatis, foliis patentibus reflexisve ovato-lanceolatis longe cuspidato-acuminatis planis glaberrimis marginibus integerrimis subtus pallidis costa valida, spicis axillaribus 3–8-floris.—*DC. Prodr.* vii. 757. (*Gunn*, 853.)

Hab. Sand-hills near Circular Head and Woolnorth, *Gunn.*—(Fl. Oct.)

Distrib. Southern coast of Australia, *Brown.*

Very closely allied to *A. serrulata*, but differing in the more prostrate, spreading branches, which cover several square feet of ground; the leaves are more patulous, often reflexed, broader, and perfectly glabrous, and have quite entire margins. The flowers (which are green) and fruit are identical with those of *A. serrulata*, of which plant this may be a variety. Gunn indeed considers this, and not the preceding, to be identical with Labillardière's plant.

Gen. IX. DECASPORA, *Br.*

Calyx bibracteatus. *Corolla* campanulata, limbo laxe barbato. *Stamina* exserta. *Squamulæ* 5 hypogynæ. *Ovarium* 10-loculare, loculis 1-ovulatis. *Bacca* 10–12-pyrena.—Frutices *pulchri, prostrati, inclinati, rarius erecti*; folia *sparsa, petiolata, interdum disticha*; spicis *plerumque terminalibus, nutantibus*; floribus *albis v. rubris*; baccis *violaceis purpureisve.*

A very beautiful genus, almost confined to Tasmania, but few species having been found on the adjacent continent, and these only on the mountains of Victoria.—Glabrous shrubs, with slender branches and often distichous leaves. *Stems* slender, inclined or prostrate, rarely erect. *Leaves* very coriaceous. *Flowers* red, in terminal (rarely axillary), nodding spikes. *Calyx* bibracteate. *Corolla* bell-shaped, its segments pilose. *Stamens* exserted. *Ovary* surrounded with ten glands, ten-celled; cells one-ovuled. *Fruit* a blue, succulent berry, with ten to twelve small nuts. (Name from *δεκα, ten*, and *σπορα, a seed.*)

1. **Decaspora disticha** (Br. Prodr. 548); glaberrima, ramulis divaricatis, foliis (pollicaribus) subdistichis ovatis vel lineari- v. oblongo-lanceolatis acuminatis planis petiolo multoties longioribus subtus 3–5-costatis.—*DC. Prodr.* vii. 758. Cyathodes disticha, *Lab. Nov. Holl.* i. 58. *t.* 82. (*Gunn*, 1200.)

Hab. Recherche Bay, in wet soil, *Labillardière, Gunn.*—(Fl. Oct.)

A very elegant and rare plant, probably confined to the South-western extreme of Tasmania, and hitherto gathered by Labillardière and Gunn only on the banks of the river at Recherche Bay.—*Stem* 6–9 feet high. *Branches* slender, divaricating, perfectly glabrous, as are the leaves and all parts. *Leaves* 1 inch long, on short petioles, flat, coriaceous, ovate, linear-oblong or oblong-lanceolate, acute or acuminate, with often a broad, sphacelate, membranous apex, smooth above, below with three to five parallel strong ribs. *Spikes* about $\frac{1}{2}$ inch long, many-flowered.

2. **Decaspora Cunninghamii** (DC. Prodr. vii. 758); ramulis divaricatis pilosis, foliis subdistichis $\frac{1}{2}$-pollicaribus ovatis ovato-oblongisve breve petiolatis acutis v. apice sphacelato obtuso planis subtus 3–7-costatis, spicis ut in *D. disticha*. (*Gunn*, 297 [*in part*] *et* 1199.)

Hab. Forests on the western half of the Island: Macquarrie Harbour, *A. Cunningham; Fagus* forests south-west of Lake St. Clair, and Mount Olympus, *Gunn.*—(Fl. Jan.)

Very similar indeed to *D. disticha*, and possibly only a variety of that species; but the branchlets are hairy, the leaves very much smaller, about half an inch long, broader in proportion, and usually slightly ciliated on the margins. Gunn remarks that it so closely resembles *Bauera* in appearance that he has often passed it over as that plant.—*Habit* straggling. *Branches* rooting. *Flowers* bright red. *Berries* violet.

3. **Decaspora Gunnii** (Hook. fil. in Lond. Journ. Bot. vi. 270); prostrata, ramulis hirtellis, foliis subdistichis ($\frac{1}{3}$-pollicaribus) oblongis ellipticis lineari-oblongisve planis subobtusis marginibus scaberulis subtus 3–7-costatis, spicis terminalibus axillaribusque brevibus paucifloris foliis brevioribus, floribus parvis, corolla glaberrima. (*Gunn*, 297.) (Tab. LXXVI.)

Hab. Dense humid forests, south-west of Lake St. Clair, and Hampshire Hills, *Gunn.*—(Fl. Nov.)

A very distinct species, differing from *D. Cunninghami* in the much smaller leaves and flowers, and in the short, often axillary spikes.—*Stems* 8–12 feet high. *Branches* strict, pubescent or pilose, very numerous, matted together. *Leaves* about $\frac{1}{3}$ inch long, subdistichous, elliptical or oblong or linear-oblong, blunt or acute, with a small sphacelated point, minutely scabrid at the margin, with three to seven stout parallel ribs beneath. *Spikes* small, much shorter than the leaves, axillary and terminal, three- to five-flowered. *Flowers* white, very small. *Sepals* about as long as the tube of the corolla. *Berry* violet-purple or lilac, size of a pea, with ten to twelve one-seeded nuts.—Plate LXXVI. Fig. 1 and 2, front and back view of leaves; 3, raceme; 4, flower; 5, ovary; 6, transverse section of ditto; 7, stamen; 8, fruit:—*all magnified.*

4. **Decaspora thymifolia** (Br. Prodr. 348); humilis, ramulis prostratis pubescentibus, foliis (parvis) longe petiolatis, convexis ovatis oblongisve subacutis subtus obsolete 3-nerviis marginibus recurvis, spicis terminalibus nutantibus multifloris foliis multoties longioribus.—*DC. Prodr.* vii. 758. (*Gunn*, 298.)

Hab. Summit of Mount Wellington, elev. 3-4000 feet.—(Fl. Nov.) (*v. v.*)

Much the smallest species of the genus, forming matted patches of a deep green colour, enlivened by the comparatively large spikes of red flowers.—*Branches* robust, pubescent or hairy. *Leaves* $\frac{1}{6}$ of an inch long, petiolate, spreading, ovate or oblong, convex, hardly acute, with recurved margins, very coriaceous. *Spikes* $\frac{1}{2}$ an inch long, many-flowered. *Flowers* densely crowded.

Gen. X. PENTACHONDRA, *Br.*

Calyx 4- v. pluri-bracteatus. *Corolla* infundibuliformis; limbo patente, barbato v. villoso. *Stamina* 5,

subsessilia. *Squamulæ* 5 hypogynæ. *Ovarium* 5-loculare, 5-ovulatum. *Bacca* 5-pyrena.—Fruticuli *parvi, montani;* foliis *sparsis;* floribus *terminalibus, erectis, albis.*

Small plants, generally found crawling over bare ground or rocks, natives of the alpine regions of Tasmania, Victoria, and New Zealand.—*Stems* generally prostrate. *Leaves* petiolate, scattered or imbricating. *Flowers* large for the size of the plant, terminal, solitary (except in *P. verticillata*), erect, white, the calyx with four or more bracts, and the lobes of the corolla densely villous. *Ovary* five-celled. *Fruit* a berry, with five nuts. (Name from πεντε, *five*, and χονδρος, a *grain*.)

1. **Pentachondra involucrata** (Br. Prodr. 549); ramis elongatis prostratis tomentosis, foliis lanceolatis elliptico-lanceolatisve acutis concavis marginibus molliter ciliatis subtus multinerviis, calycibus ciliatis 8-bracteatis corollæ tubo multoties brevioribus, corollæ lobis elongatis dense villosis, staminibus exsertis.—*DC. Prodr.* vii. 759. (*Gunn*, 301.)

Hab. Summit of Mount Wellington.—(Fl. March–May.) (*v. v.*)

Brown describes his plant as having the stem erect, but those of my specimens are always prostrate.—*Stems* a foot or more long, with ascending branches, stout, villous or pubescent. *Leaves* imbricated, $\frac{1}{3}$–$\frac{1}{2}$ inch long, elliptical or lanceolate, acute, with long soft cilia on the margins, striated with many nerves. *Flowers* large, about as long as the leaves, with small ciliated calyces, surrounded by eight bracts. *Corolla* with long, very villous lobes, and exserted stamens.

2. **Pentachondra ericæfolia** (Hook. fil. in Lond. Journ. Bot. vi. 271); caule gracili prostrato diffuso ramoso, ramulis ascendentibus apice tomentosis, foliis erectis imbricatis linearibus lineari-lanceolatisve apice incrassato obtuso supra concavis subtus obtuse carinatis basi marginibusque ciliatis, calyce 8-bracteato, corollæ tubo intus et extus piloso, limbi lobis dense villosis, staminibus inclusis. (*Gunn*, 1193.) (Tab. LXXVII. *A*.)

Hab. Abundant in the alpine districts between Marlborough and Lake St. Clair, but found nowhere else, *Gunn*.—(Fl. Jan.)

A prostrate, Heath-like, often densely-matted shrub, with rather slender prostrate stems and ascending branches, densely covered with short, tomentose, leafy branchlets. *Leaves* very small, erect, imbricating, $\frac{1}{4}$ inch long, linear-lanceolate, with a thickened blunt point, concave above, bluntly keeled at the back and furrowed at the sides, ciliated. *Flowers* sessile amongst the leaves at the ends of the short branches, white, much smaller than in *P. involucrata*. *Sepals* blunt, ciliated, half as short as the tube of the corolla, which is pubescent, with somewhat deflexed hairs both internally and externally. *Lobes* of the corolla very densely villous. *Stamens* included. *Hypogynous scales* long.—Plate LXXVII. *A*. Fig. 1 and 2, front and back view of leaves; 3, flower; 4, corolla, laid open; 5 and 6, back and front views of stamen; 7, ovary; 8, hypogynous glands:—*all magnified*.

3. **Pentachondra pumila** (Br. Prodr. 549); humilis, caule prostrato ramosissimo, ramulis compactis glabris, foliis parvis ($\frac{1}{5}$-uncialibus) imbricatis coriaceis nitidis ellipticis apice incrassato obtusis glaberrimis concavis subtus 3–7-nerviis, floribus majusculis, tubo corollæ glaberrimo elongato calyce multoties longiore, limbi lobis brevibus dense barbatis, staminibus inclusis, bacca magna rubra.—*DC. Prodr.* vii. 759; *Fl. N. Zeal.* i. 166. Epacris pumila, *Forst. Prodr.* 70. (*Gunn*, 124.)

Hab. Summits of all the mountains above 3–4000 feet high.—(Fl. Jan., Feb.) (*v. v.*)

Distrib. Mount Latrobe, Victoria, *Mueller*. Common on the New Zealand mountains.

A smaller species than any of the foregoing, forming deep-green matted patches.—*Stems* prostrate; branches ascending, 3–6 inches long. *Leaves* $\frac{1}{5}$ inch long, erect, imbricating, shining, very coriaceous, obtuse, concave, glabrous, three- to five-nerved on the back, elliptic or oblong or obovate-oblong. *Flowers* large for the size of the plant, almost twice as long as the leaves. *Calyx* very short. *Corolla* with a long glabrous tube and short villous lobes. *Stamens* included. *Fruit* bright-red, as large as a pea.

4. **Pentachondra verticillata** (Hook. fil.); fruticulus humilis, caule prostrato, ramis subfastigiatis ascendentibus, ramulis cano-pubescentibus, foliis subfastigiatim verticillatis, verticillis squamis linearibus scariosis acuminatis foliis æquilongis subtensis, foliis petiolatis linearibus longe pungenti-cuspidatis crasse coriaceis marginibus recurvis subtus cano-tomentosis nervo crasso, pagina superiore et marginibus glaberrimis nitidis, floribus ad apices ramulorum sessilibus subternis, calycibus ovato-lanceolatis 4-bracteatis tubo corollæ brevioribus, staminibus inclusis. (Tab. LXXVII. *B.*)

Hab. Mount Sorrell, Macquarrie Harbour, *Milligan.*—(Fl. Jan.)

A very remarkable plant, quite distinct from any other in the Order, by the scarious sheathing scales that clothe the stem between the whorls of leaves, and which become linear, lengthened out, and form a whorl subtending each leaf-whorl. I have not the fruit, but the structure of the ovary, disc, and the inflorescence and habit, all resemble *Pentachondra* so closely, that I have placed it in this genus.—A small alpine shrub, with straggling, prostrate, woody stems, a foot long, and ascending branches. *Leaves* whorled, $\frac{1}{3}$ inch long, petiolate, narrow-linear, cuspidate, convex, smooth, shining above, with thick recurved margins; under surface white. *Flowers* small, sunk in the leaves at the apex of the branchlets, generally three together, white. *Calyx* with four bracts, half as long as the glabrous tube of the *Corolla*, whose lobes are villous, and throat closed with deflexed hairs. *Ovary* five-celled, five-ovuled, surrounded by five glands.—Plate LXXVII. *B.* Fig. 1 and 2, front and back view of leaves; 3, flower; 4, corolla, laid open; 5, ovary and hypogynous glands; 6, transverse section of ditto; 7, anther:—*all magnified.*

Div. II. *Ovules numerous in each cell. Fruit capsular.*

Gen. XI. EPACRIS, *Smith.*

Calyx multibracteatus, bracteis textura calycis. *Corolla* tubulosa, limbo imberbi. *Stamina* epipetala, antheris supra medium peltatis. *Squamulæ* 5 hypogynæ. *Ovarium* 5-loculare; placentis columnæ centrali adnatis; ovulis numerosis. *Capsula* valvis a columna centrali persistente placentifera secedentibus.—Fruticuli *ericoidei;* foliis *sparsis, sessilibus petiolatisve;* floribus *axillaribus, solitariis spicatisve;* corolla *alba v. rubra, sæpe pulchra.*

One of the largest genera of the Order, and by far the most beautiful, forming some of the handsomest greenhouse ornaments. Fully thirty-five species are known, which, with very few exceptions (three are natives of New Zealand), are Australian, and are almost confined to the south-eastern quarter.—*Shrubs*, generally small, with scattered or imbricating leaves, and axillary, solitary, or spicate flowers. *Calyx* deeply five-lobed, coloured, surrounded with many bracts of the same texture as the sepals. *Corolla* tubular, white or red, with glabrous limb. *Stamens* inserted on the corolla, with peltate anthers. *Ovary* with five hypogynous scales, and as many cells; ovules numerous, attached to axile placentæ. *Fruit* capsular, the valves separating from the columnar axis, which bears the placentæ. (Name from επι, *upon*, and ακρις, *a mountain;* in allusion to the native place of some species.)

§ 1. *Leaves cordate and sheathing at the base.*

1. **Epacris Gunnii** (Hook. fil. in Lond. Journ. Bot. vi. 272); erecta, virgata, ramis gracilibus puberulis hirsutisve, foliis brevibus breve petiolatis late ovato-cordatis acuminatis pungentibus concavis patenti-recurvis integerrimis glaberrimis, floribus axillaribus solitariis subsessilibus, bracteis brevibus subacutis, foliolis calycinis ovatis acutis tubum corollæ late campanulatæ æquantibus ciliolatis, antheris inclusis.—E. pulchella, *var.* montana, *in part, Mueller, MSS.* (*Gunn*, 144, 315.) (Tab. LXXVIII. *B.*)

Hab. Mountainous districts, chiefly in the interior of the Island, in wet places, elev. 3–4000 feet, but also found on low grounds near Launceston; Western Mountains, Arthur's Lakes, Hampshire Hills, St. Patrick's River, Marlborough, etc., *Lawrence, Gunn, etc.* (Fl. Oct.) (*v. v.*)

Distrib. Australian Alps, *Mueller.*

A rigid, erect bush, 6 inches to 3 feet high, with few slender branches, uniformly covered with short, broad leaves, and numerous axillary sessile flowers. *Branchlets* pubescent or hairy. *Leaves* broadly ovate-cordate, acuminate, pungent, bilobed at the base, with a short petiole, quite entire. *Flowers* about as long as the leaves. *Corolla* broadly campanulate, white.—Plate LXXVIII. *B.* Fig. 1, flower; 2, corolla, laid open; 3, anther; 4, ovary and hypogynous glands:—*all magnified.*

§ 2. *Leaves ovate or lanceolate, pungent. Tube of the corolla more than twice as long as the calyx.*

2. **Epacris impressa** (Lab. Fl. Nov. Holl. i. 43. t. 58); caulibus erectis, foliis ovatis lanceolatisve attenuato-acuminatis glaberrimis breve petiolatis, floribus secus ramulos spicatis, sepalis acutis tubo corollæ $\frac{1}{2}$–$\frac{1}{4}$ brevioribus. (*Gunn*, 142, 522 *in part*, 857.)

Var. *α*; ramulis pubescentibus, foliis lanceolatis sessilibus.—E. impressa, *Br. Prodr.* 551; *Sweet, Fl. Aust. t.* 4; *Lodd. Bot. Cab.* 1691; *Hook. Bot. Mag.* 3407; *DC. Prodr.* vii. 762.

Var. *β. campanulata;* foliis ovatis acuminatis subcordatis, corolla calyce duplo v. triplo longiore.—E. campanulata, *Lodd. Bot. Cab. t.* 1925 *et* 1931; *DC. Prodr. l. c.*

Var. *γ. variabilis;* foliis ovatis acuminatis, corolla calyce 4-plo longiore.—E. variabilis, *Lodd. Bot. Cab. t.* 1816; *DC. Prodr. l. c.*

Var. *δ. nivea;* ramulis velutinis, foliis ovato-lanceolatis marginibus scaberulis.—E. nivea, *DC. Prodr. l. c.* E. nivalis, *Grah. in Jameson's Journ.* 1833. 184; *Lodd. Bot. Cab. t.* 1821; *Hook. Bot. Mag.* 3253; *Lindl. Bot. Reg.* 1531.

Hab. Abundant throughout the Island, ascending to 2000 feet, and often covering large tracts of land.—(Fl. July–Oct.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to Port Lincoln. (Cultivated in England.)

Too common a plant to require a detailed description, and too beautiful to be overlooked by the most careless observer. It is very variable in stature, colour of flowers, size, form, and direction of its leaves.—A slender shrub, generally sending up several erect leafy branches, a foot or so high, from a short woody stem, and covered with beautiful white or red tubular axillary flowers. *Branches* generally pubescent or hirsute. *Leaves* $\frac{1}{8}$–$\frac{1}{2}$ inch long, elliptical or ovate or lanceolate, acuminate and pungent, shortly petioled or sessile, glabrous or slightly scabrid at the margins, even or nerved below, more or less concave or plane. *Flowers* half an inch long, generally pendulous or nodding.

3. **Epacris ceræflora** (Graham in Jameson's Journ. June, 1832); erecta, virgata, ramulis tomentosis, foliis anguste lanceolatis acuminatis pungentibus patentibus margine scaberulis, floribus secus ramulos spicatis secundis, sepalis ovatis acuminatis apice attenuato pungente.—*Hook. Bot. Mag. t.* 3243. *DC. Prodr.* vii. 762. *An* E. impressa (*β.* parviflora), *Lindl. Bot. Reg.* 1839. *t.* 19? (*Gunn*, 1203.) *An species distincta?*

Hab. Common, often growing with *E. impressa, Lawrence, Gunn*, etc.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia, Victoria, *Mueller.* (Introduced into England.)

I very much doubt if this is specifically distinct from *E. impressa.* Gunn frequently pointed it out to me growing along with that plant at Hobarton, and flowering at the same time, where it was readily distinguished by its narrow leaves, more slender habit, more acute sepals, and shorter waxy-white or rarely red flowers; but I find, from his valuable notes, that he considers it somewhat doubtful, and I have many specimens of *E. impressa* that present one or other character of *E. ceræflora.*

4. **Epacris ruscifolia** (Br. Prodr. 550); fruticulus humilis rigidus, ramis abbreviatis, ramulis glabris, foliis (parvis) patulis brevissime petiolatis elliptico-ovatis lanceolatisve acuminatis pungentibus mar-

ginibus glabris scaberulisve, floribus axillaribus, corolla cylindracea sepalis ovatis acuminatis duplo v. triplo longiore.—*DC. Prodr.* vii. 761. (*Gunn*, 857 ?, 858.) E. reclinata, *A. Cunn. MSS.?*

Hab. Islands in Bass' Straits, *Brown;* Hampshire Hills, Woolnorth, Rocky Cape, and Circular Head, *Gunn.*—(Fl. Dec., Jan.)

Distrib. South-eastern Australia, *Mueller;* Blue Mountains, *A. Cunningham.* (Introduced into England.)

This again approaches very closely indeed to states of *E. impressa*, to which Gunn is inclined to refer some of his specimens; it however appears to differ in the low, more or less procumbent, straggling habit, the smaller, shorter leaves, not above $\frac{1}{4}$ inch broad, in their ovate or elliptical-lanceolate form, and in the flowers not being so numerous, whence the branches do not look like flowering spikes. Sieber's no. 82 (in Herb. Hook.) does not appear distinct from this, except in the longer tube of the corolla; and Allan Cunningham sends the same plant from Port Jackson, under the name of *E. ruscifolia*, Br.

§ 3. *Leaves ovate or lanceolate, not cordate at the base, decidedly pungent. Tube of corolla little if at all longer than the calyx.*

5. **Epacris lanuginosa** (Lab. Nov. Holl. i. p. 42. t. 57); fruticulus erectus, ramis robustis villosis, foliis erectis subimbricatis lineari-lanceolatis acuminatis pungentibus glaberrimis nitidis marginibus scaberulis subtus convexis, floribus axillaribus sparsis v. in spicam foliosam densam ad apices ramulorum congestis, calycibus acutis acuminatisve tubo corollæ æquilongis v. brevioribus margine ciliato lanuginoso, staminibus inclusis, stylo et ovario hirsutis.—*Br. Prodr.* 551; *DC. Prodr.* vii. 763.

Var. *a*; calycibus acutis longitudine tubi corollæ, foliis latioribus, floribus in spicam densissime congestis. (*Gunn*, 145.)

Var. β; calycibus longe acuminatis tubo corollæ brevioribus, foliis anguste lanceolatis, floribus laxius spicatis axillaribusve. (*Gunn*, 146 ?, 855.)

Var. γ; calycibus acuminatis corollæ tubo brevioribus, foliis anguste lanceolatis, floribus subcapitatis. (*Gunn*, 146 *et* 1985.)

Hab. Not uncommon in hilly districts in various parts of the Island. Var. *a*. Campbelltown, *Gunn;* Port Arthur, Macquarrie Harbour, *A. Cunningham*. Var. β. Rocky Cape, *Gunn*.—(Fl. Feb.) Var. γ. Hampshire Hills, Georgetown, Circular Head, Marlborough.—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia.

A very variable plant (*Gunn*), especially in the arrangement of the flowers, which are axillary, sometimes spicate along the branchlets, and at others collected into dense, terminal, cylindrical, ovoid, or capitate heads. The leaves vary in breadth, and the sepals in breadth, in the length of their acuminate points, and comparative length to the tube of the corolla.—An erect, woody, rigid shrub, 1–3 feet high, generally sparingly branched. *Branches* villous or pubescent. *Leaves* about $\frac{1}{3}$ inch long, erect, imbricating, lanceolate, acuminate, with long, pungent points; margins scaberulous. *Flowers* white, longer than the leaves. *Calyx* rather long; sepals ciliated with woolly hairs. *Corolla* tubular. *Stamens* included. *Style* and ovary villous.

6. **Epacris mucronulata** (Br. Prodr. 552); ramis erectis strictis virgatis, ramulis puberulis, foliis brevissime petiolatis curvatis erecto-patentibus lanceolatis ovato-lanceolatisve longe acuminatis pungentibus basi subcordatis valde concavis glaberrimis, floribus axillaribus ad apices ramulorum subcapitatis, calycibus subacutis margine minute ciliatis lanatisve tubo campanulato corollæ æquilongis, antheris exsertis, stylis ovariisque glabris.—*DC. Prodr.* vii. 764. (*Gunn*, 620.)

Hab. Hobarton and New Norfolk, *Gunn;* Mount Wellington, *Everett*.—(Fl. Oct.) (*v. v.*)

I have referred this plant to Brown's *E. mucronulata*, though the calyces are ciliated. In general habit and foliage it resembles *E. Gunnii*, the leaves being very concave, and curving outwards from the base, which clasps

the stem, but they are hardly, if at all, cordate at the base, and the flowers are collected into terminal heads. *Corolla* white. *Stamens* exserted.

7. **Epacris heteronema** (Lab. Nov. Holl. i. 42. t. 56); fruticulus erectus, ramulis robustis, foliis subimbricatis concavis erecto-patulis ovato- v. elliptico-lanceolatis acuminatis pungentibus integerrimis subtus striatis, floribus axillaribus versus apices ramulorum subcapitatis, calycibus multibracteatis, bracteis arcte imbricatis sepalisque (longitudine tubi corollæ) ovato-acuminatis subcarinatis glabris, corolla glaberrima, ovario styloque brevibus puberulis.—*Br. Prodr.* 551; *DC. Prodr.* vii. 763. (*Gunn*, 1207, 1208.)

Hab. Recherche Bay, *Labillardière;* Port Davey, *Milligan;* and high heathy plains between the Franklin and Gordon Rivers, *Gunn.*—(Fl. May, June.)

A small, stout, erect shrub, a few inches to a foot high, with short, rigid branches, clothed with somewhat imbricating leaves and pubescent branchlets. *Leaves* erecto-patent or curved, concave, their sides often embracing the stem, $\frac{1}{3}$ inch long, shortly petioled, very coriaceous, quite glabrous, ovate or elliptic-lanceolate, acuminate and pungent, striated at the back. *Flowers* axillary, generally collected towards the ends of the branches into terminal heads. *Bracts* very numerous, imbricating, ovate-lanceolate, acuminate, clothing the sepals, which are equal in length to the tube of the corolla.—This species is best recognized from the preceding of this section and the following, by the larger, more concave, rigid, pungent leaves, numerous acuminate bracts, glabrous corolla, short puberulous style, and slightly pilose ovary. The var. *β.*? *subreflexa*, DC., from New South Wales (*E. heteronema*, Hook. Bot. Mag. t. 3257), appears to be a different species or variety.

8. **Epacris squarrosa** (Hook. fil.); fruticulus, ramis glabris, ramulis puberulis, foliis patulo-recurvis coriaceis planiusculis petiolatis ovatis v. ovato-lanceolatis acuminatis pungentibus subcarinatis enerviis marginibus integerrimis subrecurvis, floribus versus apices ramulorum axillaribus longitudine folii, bracteis plurimis imbricatis ovatis acutis glabris, sepalis subacutis longitudine corollæ, staminibus exsertis, stylo ovarioque glaberrimis. (*Gunn*, 198, 1209 *in part.*)

Var. *β*; foliis minoribus late ovato-ellipticis. (*Gunn*, 1205.)

Hab. Elizabeth River, Oyster Bay, on the east coast, *Gunn.*—(Fl.?) Var. *β*. Spring Bay.—(Fl. April.)

Very distinct from any of the above-described species, but possibly one of the states of the protean *E. serpyllifolia*, from which it may be distinguished by the acuminate and decidedly pungent leaves, which are nearly plane, recurved, and resemble a good deal those of *Leptospermum squarrosum*. From *E. heteronema* it differs abundantly in the plane, more petiolate, subcarinate leaves, shorter flowers, broader, less acuminated bracts and sepals, smaller corolla, and exserted stamens.

§ 4. *Leaves ovate or lanceolate, not cordate at the base, blunt, acute, or acuminate, but not pungent. Tube of corolla not longer than the calyx.*

9. **Epacris myrtifolia** (Lab. Nov. Holl. i. p. 41. t. 55); fruticulus erectus, ramulis pubescentibus, foliis subimbricatis petiolatis ovatis ovato-lanceolatisve acuminatis planis v. subconcavis crassis margine callosis subtus striatis, floribus axillaribus et in capitulis spicisve foliis brevioribus aggregatis, bracteis plurimis ovatis acutis, sepalis acuminatis longitudine corollæ, corollæ tubo brevi glaberrimo, antheris subexsertis, ovario styloque brevi glaberrimis.—*Br. Prodr.* 551; *DC. Prodr.* vii. 763. (*Gunn*, 1206.)

Hab. Recherche Bay, *Labillardière;* Port Arthur.—(Fl. Oct.) (*v. v.*)

We have seen no Mount Wellington specimens of this plant, and suspect that De Candolle may have taken some other species (perhaps *E. serpyllifolia*) for it; and indeed it is very difficult to discriminate some states of that plant from this. Our Port Arthur specimens precisely accord with Labillardière's figure; and as Gunn has himself never gathered the species, it is probably almost confined to the extreme south of the Island.—A very robust, sub-

erect species, a foot high, with short, stout, woody branches, and pubescent branchlets. *Leaves* petioled, closely set, very coriaceous, rather concave, ovate or lanceolate, acuminate, but not pungent, $\frac{1}{4}$–$\frac{1}{3}$ inch long, striated beneath. *Flowers* axillary, spicate or capitate, shorter than the leaves. *Bracts* and *sepals* variable in length and breadth, acute, glabrous. *Corolla* short, glabrous. *Ovary* and very short *style* glabrous.

10. **Epacris serpyllifolia** (Br. Prodr. 551); humilis, ramis breviusculis prostratis ascendentibusve, ramulis glabris, foliis (parvis) petiolulatis ovatis ellipticis subrotundatisve acutis apice subincrassato crassis nitidis glaberrimis subtus subcarinatis integerrimis, floribus axillaribus terminalibusque foliis longioribus, bracteis sepalisque ovatis acutis glabris, antheris inclusis, ovario styloque brevi glaberrimis.—*DC. Prodr.* vii. 763. (*Gunn*, 316, 1209 *in part.*)

Hab. Summits of all the mountains at elevations of 3000 to 4500 feet.—(Fl. Oct.) (*v. v.*)

Distrib. Australian Alps, elev. 5–6000 feet, *Mueller.*

A very much smaller-leaved plant than *E. myrtifolia* (though not so much so as *E. microphylla*), and further differing in its prostrate habit and comparatively larger flowers; the leaves are also broader, more keeled, less striate and less acuminate, the apex itself being the thickened apex of the midrib, which forms the blunt keel. A. Cunningham's *E. heteronema*, from Mount Wellington, is this, as is most of Mueller's Victoria plant called *E. heteronema*, as well as his *E. heteronema*, var. *serpyllifolia*, to which he refers Brown's plant. Under *E. squarrosa* I have pointed out the difference between this species and that one.—A small, prostrate species. *Leaves* erect or patent, $\frac{1}{4}$ inch long, broadly ovate, ovate-lanceolate, or almost orbicular, acute, very thick, shining. *Flowers* short, but longer than the leaves, generally capitate, white. *Anthers* included. *Ovary* and *style* glabrous.

11. **Epacris exserta** (Br. Prodr. 551): caule prostrato, ramis ascendentibus elongatis ramulisque glabris, foliis suberectis longiuscule petiolatis lanceolatis acutis supra planis subtus convexiusculis (sicco) sulcatis obscure 3–5-nerviis, floribus axillaribus foliis æquilongis, bracteis imbricatis sepalisque acutis, antheris exsertis, ovario styloque elongato glaberrimis.—*DC. Prodr.* vii. 763. (*Gunn*, 143, 198 *in part*, 250.)

Hab. Northern parts of the Island, South Esk River, Launceston, *Gunn.*—(Fl. Aug., Sept.)

A very distinct-looking species from *E. serpyllifolia*, though not easily defined; the whole plant is much larger, the branches much longer (1–2 feet), the leaves longer, erect, $\frac{1}{3}$ inch long, narrower, being almost uniformly lanceolate or elliptic-lanceolate, with three to five ribs or nerves on the under surface; the flowers too are axillary, rarely collected into terminal spikes or heads: they are as long as the floral leaves; the anthers are decidedly exserted, and the style is longer.

12. **Epacris virgata** (Hook. fil. in Lond. Journ. Bot. vi. 271); erecta, glaberrima v. ramulis puberulis, ramis elongatis virgatis gracilibus laxe foliosis, foliis (parvis) suberectis planis ellipticis elliptico-ovatisve subacutis subtus planis obscure 3-nerviis, floribus axillaribus foliis æquantibus, bracteis sepalisque subacutis glaberrimis, antheris exsertis, ovario styloque glaberrimis. (*Gunn*, 1204.) (Tab. LXXIX. *A.*)

Hab. Base of the Asbestos Hills, Yorktown, and between Hobarton and the Huon, *Gunn.*—(Fl. Oct.–Jan.)

A very elegant species, but perhaps not distinct from *E. exserta*. My specimens may however be at once distinguished by their erect habit, the whole plant consisting of a few slender, graceful, sparingly-branched twigs, 12–18 inches high, and the leaves being smaller, broader, often subrotund, and flatter; it is an elegant and pretty plant.—Plate LXXIX. *A.* Fig. 1, flower; 2, corolla, laid open; 3, stamen; 4, ovary and hypogynous glands; 5, germen:—*all magnified.*

13. **Epacris obtusifolia** (Smith, Exot. Bot. 77. t. 40); erecta, ramis paucis virgatis elongatis, ramulis glabris, foliis erectis subimbricatis lanceolatis apice calloso obtuso planis dorso obscure 3-nerviis, floribus axillaribus foliis longioribus, bracteis calycibusque subacutis marginibus villosis, antheris inclusis, ovario styloque glaberrimis.—*Br. Prodr.* 451; *DC. Prodr.* vii. 551; *Lodd. Bot. Cab.* 293. (*Gunn*, 856.)

Hab. In wet soil, northern and southern shores of the Island: Recherche Bay, Detention River, and Rocky Cape, *Gunn.*—(Fl. Nov., Dec.)

Distrib. South-eastern Australia, from Port Jackson to Victoria. (Introduced into England.)

A very elegant species, 6–24 inches high. *Stems* slender, erect, 1–2 feet high, very sparingly branched: the branches slender, erect. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ inch long, coriaceous, erect, subimbricate, lanceolate, with an obtuse, callous apex, obscurely three-nerved at the back. *Flowers* axillary, erect, horizontal or nodding, longer than the leaves. *Bracts* and *sepals* subacute, fringed with white down. *Anthers* included. *Style* and *ovary* quite glabrous.—Australian specimens are usually very much larger in all their parts than the Tasmanian, and have often broader leaves.

14. **Epacris Franklinii** (Hook. fil.); frutex erectus fastigiatim ramosus, ramulis gracilibus glabris, foliis erectis subimbricatis petiolatis lanceolatis acuminatis glaberrimis dorso subcarinatis obscure 3-nerviis, floribus axillaribus, pedicellis elongatis laxe bracteatis, bracteis calycibusque subacutis glaberrimis post anthesin subpatentibus, ovario styloque glaberrimis. (*Gunn*, 1987.) (Tab. LXXIX. *B.*)

Hab. Banks of the Franklin River, near Macquarrie Harbour, in annually inundated places, *Gunn.*—(Fl. Jan.)

A remarkably distinct and peculiar-looking species, 6 feet high, much and fastigiately branched. *Branches* very crowded, covered with black bark. *Leaves* erect, imbricating, $\frac{1}{3}$ inch long, upon slender petioles, lanceolate, acuminate (not pungent), nerveless above, obscurely three-nerved below. *Flowers* axillary, solitary, on elongated curved pedicels 1–2 lines long, and loosely covered with short bracts, a character that abundantly distinguishes this species from all its preceding allies.—Plate LXXIX. *B.* Fig. 1, leaf; 2, flower; 3, corolla, laid open:—*all magnified.*

15. **Epacris corymbiflora** (Hook. fil.); fruticulus robustus, caule brevissimo crasso, ramis brevibus suberectis superne subcorymboso-fastigiatis, foliis erectis appressis imbricatis crasse coriaceis ovatis ovato-lanceolatisve acutis non pungentibus dorso subcarinatis marginibus integerrimis glaberrimis, floribus subcorymbosis (magnis) pedicellatis subterminalibus folio longioribus, bracteis pedicello parvis, bracteis calycinis sepalisque subacutis concavis minute ciliatis coriaceis, corollæ tubo calycem æquante, antheris subexsertis, ovario styloque glaberrimis. (*Gunn*, 1988.) (Tab. LXXVIII. *A.*)

Hab. White Hill Plains, near the Franklin River, Macquarrie Harbour, in poor, peaty soil, *Gunn.*—(Fl. Feb.)

Of this most distinct species I have seen fruiting specimens only, with the corollas however attached, and it is at once distinguished from all its Tasmanian congeners by the large bracts and calyx, and subcorymbose arrangement of its pedicelled flowers; its habit too is peculiar, as it is a small plant, with a very short, thick, woody stem, and several ascending, short branches, 4–8 inches long, fastigiately or somewhat corymbosely branched above, and clothed with more or less appressed imbricating leaves. Some of these characters are probably variable, for, though constant in Gunn's numerous specimens, it is to be recollected that all these are from one locality.—*Leaves* $\frac{1}{4}$ inch long, very thick and coriaceous, shining, somewhat concave, erect, appressed, ovate or ovate-lanceolate, acute, with an obscure keel, perfectly glabrous. *Flowers* pedicelled, the bracts on the pedicel small; those below the calyx large, two-thirds the length of the sepals, blunt, and, as well as the subacute sepals, minutely fringed. *Tube* of the *corolla* narrow, as long as the sepals. *Capsule* small, subcoriaceous.—Plate LXXVIII. *A.* Fig. 1, flower; 2, corolla, laid open; 3, stamen; 4, ovary, with hypogynous glands:—*all magnified.*

16. **Epacris petrophila** (Hook. fil.); fruticulus depressus ramosissimus, ramulis puberulis, foliis minimis laxe v. dense imbricatis erectis patulisve sessilibus crasse coriaceis planiusculis breviter oblongis ovatisve obtusis supra concavis subtus obtuse carinatis marginibus vix scaberulis, floribus (parvis) dioicis? ad apices ramulorum dense congestis brevissime pedicellatis foliis longioribus, bracteis sepalisque minute ciliatis obtusis sordide albis, corollæ late campanulatæ tubo brevi calycem æquante, antheris subexsertis,

ovario styloque glaberrimis.—E. microphylla, *Nob. in Lond. Journ. Bot.* vi. 271, *non Brown.* (*Gunn*, 1210.)

Hab. Stony places on the summits of the Western Mountains, and at Arthur's Lakes, elev. 4000 feet, *Gunn.*—(Fl. Feb.)

Distrib. Munyang Mountains, Victoria, *Mueller.*

A small, rigid, prostrate or depressed, very much branched, and very small-leaved species, resembling *Bæckia Gunniana* in some respects.—*Stems* stout, woody, clothed with black bark; branchlets more slender, leafy. *Leaves* suberect, imbricating or patent, 1–1½ line long, deep green, shining, ovate or oblong, sessile, quite entire, very thick and coriaceous, young ones minutely puberulous, broad at the base. *Flowers* collected in large, terminal, white capitula, small, but twice as large as the leaves. *Bracts* and *calyx* whitish, blunt. *Corolla* broadly campanulate.—A most distinct species.

Gen. XII. PRIONOTES, *Br.*

Calyx ebracteatus. *Corolla* tubulosa, fauce aperta, limbo imberbi. *Stamina* 5, hypogyna, subæqualia, tubo semiadhærentia; antheræ septo completo. *Squamæ* 5 hypogynæ. *Ovarium* 5-loculare; *ovulis* placentis e apice loculi pendulis affixis. *Capsula* 5-valvis.—Fruticuli *erecti v. prostrati*; foliis *subdistichis*; floribus *axillaribus*; pedicellis *elongatis, bracteatis.*

The curious plant belonging to this genus differs from all others of the Order known, in having distinctly two-celled anthers, as originally noticed by Labillardière; it has also hypogynous filaments, which are more or less attached to the corolla. In these important particulars *Prionotes* presents the transition-form between *Epacrideæ* and *Ericeæ*, and (what is no less remarkable) a Fuegian species of this genus presents the only known American Epacrideous plant. The fact of the Tasmanian species of *Pernettya* (otherwise exclusively an American genus) having anthers without the characteristic awns of that genus, is in one respect a parallel anomaly. *Prionotes* is confined to Tasmania as a genus, and differs from *Epacris* in the pedicelled flowers, which, if bracteate, do not have the bracts placed close under the calyx, in the bilocular anthers and hypogynous stamens. (Name from πριονωτος, *serrated.*)

1. **Prionotes cerinthoides** (Brown, Prodr. 552); frutex glaber prostratus, ramis gracilibus, ramulis hirtellis, foliis distichis oblongis lineari-oblongisve obtuse serratis, pedicellis solitariis folio subæquilongis calyceque puberulis, bracteolis parvis appressis, sepalis brevibus late ovatis, corolla (magna) cylindracea glaberrima, lobis parvis, capsulis hirtis oblongis superne ad medium 5-lobis.—*DC. Prodr.* vii. 766. Epacris cerinthoides, *Lab. Nov. Holl.* i. 43. *t.* 59. (*Gunn*, 1211.)

Hab. Recherche Bay, *Labillardière;* sides of Mount Wellington, elev. 3000 feet, in moss; dense forests extending from Franklin to Gordon River and Macquarrie Harbour, *Milligan, Gunn.*—(Fl. April.)

A very beautiful plant, sometimes attaining 30 feet in height; easily recognized by its somewhat distichous, oblong, blunt, serrated leaves, and large, solitary, pedicelled, pendulous, red flowers, with a very small calyx of broad, ovate sepals, and large, cylindrical corolla, upwards of half an inch long.—*Stems* very slender, seldom thicker than a quill. *Branches* long, slender, and interwoven, so as to present a dense screen of deep green foliage.

Gen. XIII. ARCHERIA, *Hook. fil.*

Calyx ebracteatus. *Corolla* cylindracea v. campanulata, limbo imberbi v. barbato. *Stamina* fauce corollæ inserta; antheris 1-locularibus. *Discus hypogynus* 5-lobus. *Ovarium* 5-loculare; *ovulis* ascendentibus, placentis basilaribus erectis insertis. *Capsula* 5-locularis.—Fruticuli Tasmaniæ; foliis *subdistichis v. undique insertis;* floribus *pedicellatis, axillaribus v. in racemos terminales dispositis;* pedicellis *basi bracteatis.*

A remarkable genus, intermediate between *Prionotes* and *Epacris;* some species having the distichous foliage,

and solitary, pedicelled flowers of *Prionotes;* others differing from both genera in having terminal racemes; and all from *Prionotes* in the stamens being inserted on the throat of the corolla, and the placentæ being basilar; whilst they all differ from *Epacris* in their ebracteate calyces and placentation.—(I have named this curious genus in honour of *W. Archer, Esq.*, of Cheshunt, in Tasmania, a zealous botanist and acute observer, to whom I am indebted for a very valuable series of drawings of *Orchideæ*, which will be published in this work, and for much important aid in its preparation.)

§ 1. *Leaves distichous. Flowers axillary, solitary. Style elongated.*

1. **Archeria hirtella** (Hook. fil.); frutex v. arbuscula, ramulis hirtellis, foliis subdistichis petiolatis ovatis acutis pungentibus crasse coriaceis serrulato-ciliatis, pedicellis axillaribus curvatis folio brevioribus basi bracteolatis, sepalis ovatis acuminatis tubo corollæ late cylindraceæ dimidio brevioribus, stylo elongato, capsula glaberrima.—Epacris hirtella, *Nob. in Lond. Journ. Bot.* vi. 271. (*Gunn*, 1202.) (Tab. LXXXI.)

Hab. Dense forests near Macquarrie Harbour, and in the Acheron Valley, south-west of Lake St. Clair, *Gunn.*—(Fl. Feb.)

A large shrub or small tree, 10–12 feet high, with stout, woody stems, and rather spreading branches, covered with short, rigid, spreading pubescence.—*Leaves* $\frac{1}{3}$ inch long, very rigid and coriaceous, glabrous and shining, shortly petioled, ovate, acute, pungent, with minutely serrulate margins. *Flowers* towards the ends of the branches. *Pedicels* shorter than the leaves, curved, with several short, concave, imbricating bracts at the base. *Corolla* about as long as the leaves. *Capsule* glabrous. The tips of the branches and young leaves are of a bright crimson colour.—Plate LXXXI. Fig. 1, leaf; 2, flower; 3, corolla, laid open; 4, stamens; 5, ovary; 6, transverse section of ditto:—*all magnified.*

2. **Archeria eriocarpa** (Hook. fil.); frutex, ramulis divaricatis subdistichis gracilibus hirtis, foliis distichis divaricatis lanceolatis acuminatis pungentibus serrulatis subtus costa prominula, pedicellis axillaribus brevibus basi bracteatis sepalisque pubescentibus, corolla cylindracea, stylo elongato, capsula dense tomentosa. (*Gunn*, 1989.) (Tab. LXXX. *B.*)

Hab. With the former species, in dense forests south-west of Lake St. Clair, *Gunn;* Macquarrie Harbour, *Milligan, Gunn.*—(Fl. Jan.)

A slender shrub, 8–12 feet high, probably inclined or prostrate, having slender, distichous, divaricating, hairy branches, covered with distichous, small, spreading leaves.—*Leaves* glabrous, $\frac{1}{3}$ inch long, lanceolate, acuminate, pungent, serrulate. *Pedicels* very short, curved, pubescent, with small, blunt, concave, imbricating bracts at the base. *Sepals* ovate, lanceolate, pubescent. *Corolla* longer than the leaves, cylindrical. *Style* very long. *Capsule* densely pubescent.—Plate LXXX. *B.* Fig. 1, leaf; 2, flower; 3, corolla, laid open; 4, stamens; 5, ovary; 6, transverse section of ditto.

§ 2. *Leaves subimbricating. Flowers in terminal racemes. Corolla with villous lobes. Styles short.*

3. **Archeria serpyllifolia** (Hook. fil.); fruticulus rigidus depressus ramosus glaberrimus, ramulis ascendentibus erectisve fastigiatim ramosis, foliis undique insertis petiolulatis suberectis crasse coriaceis ellipticis-ovatis obtusiusculis superne subconcavis subtus subcarinatis marginibus incrassatis minutissime serrulatis junioribus ciliolatis, paniculis terminalibus erectis 8–10-floris, pedicellis basi 1-bracteolatis, sepalis oblongo-lanceolatis ciliolatis obtusis corollæ campanulatæ tubo subæquilongis lobis villosis, antheris inclusis, ovario apice 5-lobo styloque brevissimo glaberrimis. (*Gunn*, 2032.) (Tab. LXXX. *A.*)

Hab. Rocks at the summit of Mount Olympus, elev. 4000 feet, *Gunn.*—(Fl. Dec., Jan.)

A very rigid, woody shrub, 6–10 inches high, with somewhat fasciculate, ascending, or erect branches, and leaves resembling those of *Epacris serpyllifolia.—Branches* glabrous. *Leaves* suberect, petiolulate, elliptical-ovate, subacute, very thick and coriaceous, minutely serrulate, $\frac{1}{3}$ inch long. *Flowers* crowded on short, erect, terminal,

six- to eight-flowered racemes. *Peduncles* bracteate at the base; pedicels with one bracteole at their insertion. *Calyx*-lobes about as long as the tube of the campanulate corolla.—PLATE LXXX. *A*. Fig. 1, leaf; 2, flower; 3, corolla, laid open; 4, stamen; 5, ovary; 6, vertical section of ditto:—*all magnified.*

4. **Archeria minor** (Hook. fil.); fruticulus glaberrimus fastigiatim ramosus, ramis ramulisque robustis, foliis undique insertis suberectis petiolulatis late elliptico-ovatis obtusis supra subconcavis subtus carinatis valde coriaceis nitidis marginibus lævibus v. minutissime serrulatis, racemis terminalibus densifloris erectis, floribus 6–8 parvis, bracteis floribusque ut in *A. serpyllifolia* sed multo minoribus, capsula parva apice profunde 5-loba.

HAB. Mount Sorrell, Macquarrie Harbour, *Milligan.*—(Fl. Dec.)

Very similar in most respects to *A. serpyllifolia*, but smaller in all its parts, the leaves being about ¼ inch long, and the flowers rather shorter than the leaves.

Gen. XIV. SPRENGELIA, *Sm.*

Calyx subcoloratus, bracteis plurimis cinctus, 5-partitus. *Corolla* rotata, lobis angustis imberbibus. *Stamina* hypogyna, glabra. *Antheræ* liberæ v. connatæ, septo immarginato. *Squamæ* hypogynæ 0. *Capsula* 5-valvis, placentis columnæ centrali adnatis.—Fruticuli *erecti;* ramis *denudatis, vix annulatis;* foliis *patulis, recurvis, basi ovatis, ramulos vaginantibus, dein subulato-acuminatis;* floribus *sessilibus, ramulos brevissimos terminantibus;* calyce *sepalis corollam subæquantibus;* corollæ *pallide purpurascentis tubo brevissimo, demum a basi 5-fido.*

This is a very southern genus of the Order, about four or five species being known, all natives of Tasmania and the southern coasts of Australia.—Small, glabrous shrubs, with short leaves, very broad at the base, and there sheathing the stem. *Flowers* sessile, on short lateral branchlets that are aggregated towards the ends of the branches. *Sepals* five, bracteate, coloured, rigid, about the length of the narrow lobes of the rotate corolla. *Corolla* rotate, with narrow spreading lobes. *Stamens* hypogynous. *Anthers* free or connate. (Named in honour of *Kurt Sprengel*, an eminent German botanist.)

1. **Sprengelia incarnata** (Smith, Act. Stockh. 1794. p. 260. t. 8); antheris connatis barbatis.—*Br. Prodr.* 555; *DC. Prodr.* vii. 768; *Andr. Bot. Rep. t.* 2; *Cav. Ic.* iv. *t.* 343. (*Gunn*, 155.)

HAB. Common, especially in wet places, in hilly districts throughout the Island.—(Fl. Nov., Dec.) (*v. v.*)

DISTRIB. South-eastern Australia, from Port Jackson to Victoria, ascending the Alps to 5000 feet, *Mueller.* (Introduced into England.)

A small, glabrous, squarrose bush, 1–5 feet high, with erect, naked, terete, woody stems, the branches covered with imbricating leaves, and terminated by ovate or conical heads of pale flesh-coloured flowers. *Leaves* ⅓–⅔ inch long, rigid, patent, recurved, gradually narrowed from an ovate sheathing base to a subulate acuminate point, very concave. *Flowers* exceedingly variable in size, ⅙–⅓ inch long. *Sepals* pale, as long as the narrow lobes of the corolla. *Stamens* with short filaments, and connate, villous or bearded anthers.

2. **Sprengelia propinqua** (A. Cunn. in DC. Prodr. vii. 768); antheris liberis barbatis.—S. macrantha, *Nob. in Lond. Journ. Bot.* vi. 273. (*Gunn*, 1212.)

HAB. In wet, peaty soil, Mount Wellington, *A. Cunningham;* Recherche Bay and Loddon Plains, south-west of Lake St. Clair, *Gunn.*—(Fl. Dec., Jan.)

Very similar in habit and general appearance to *S. incarnata*, but smaller, and the leaves are usually rather broader and less pungent, and the flowers are white, ⅓–½ inch long, with free, bearded anthers.—De Candolle considers it as intermediate in all respects between *S. incarnata* and *S. montana*. I at one time thought it an extremely

distinct plant, but a fuller series of specimens shows that it is more probable that all these will prove varieties of one species.

3. **Sprengelia montana** (Br. Prodr. 555); humilis, foliis ovatis acuminatis apice obtusiusculo, antheris liberis imberbibus.—*DC. Prodr.* vii. 768. (*Gunn*, 291.)

Hab. Wet places on the summits of Mount Wellington, the Western and other mountain ranges, elev. 3–4000 feet.—(Fl. Dec.) (*v. v.*)

Generally a smaller species than either of the above, with shorter leaves, that are acuminate, but not pungent, smaller, deeper-coloured flowers, and free, glabrous anthers.

Gen. XV. CYSTANTHE, *Br.*

Calyx subfoliaceus, bracteatus. *Corolla* clausa, calyptræformis, transversim dehiscens, basi truncata persistente. *Stamina* hypogyna, persistentia, antheris apice bilobis. *Squamulæ* hypogynæ 0. *Ovarium* 5-loculare; *ovulis* placentis e apice loculorum pendulis affixis.—Fruticulus *habitu* Sprengeliæ, *sed* ramis *annulatis*.

1. **Cystanthe sprengelioides** (Brown, l. c.)—*DC. Prodr.* vii. 769. (*Gunn*, 290 *et* 1213.)

Var. *α*; foliis elongatis patulis recurvisve.

Var. *β*; foliis brevioribus erectis.

Var. *γ*; foliis brevibus late ovatis patulis.

Hab. Abundant in subalpine and alpine parts of the Colony, ascending to 4000 feet.—(Fl. Oct.-Dec.) (*v. v.*)

As a genus *Cystanthe* is readily distinguished from *Sprengelia* by the corolla forming a closed conical calyptra, which dehisces transversely a little above its base, the upper part falling away, and the lower being very persistent. The stamens are hypogynous and persistent, with stout spreading filaments and two-lobed anthers. In stature and habit *C. sprengelioides* entirely resembles *Sprengelia incarnata*, but the branches are marked with transverse scars where the leaves are inserted, and the flowers are collected into much denser, smaller terminal heads. The stems vary from 3 inches to 3 feet high, and the leaves from $\frac{1}{4}$–1 inch long; the alpine specimens have much broader, shorter, and blunter leaves, but Gunn remarks that mere elevation does not alter the character of the plant.

Gen. XVI. PILITIS, *Lindl.*

Calyx subfoliaceus, bracteatus. *Corolla* clausa, calyptræformis, transversim dehiscens, basi truncata persistente. *Stamina* persistentia, hypogyna. *Squamulæ* hypogynæ 5, bilobæ. *Ovarium* 5-loculare, ovulis placentis e apice loculorum pendulis affixis.—Frutex *habitu* Sprengeliæ *et* Cystanthes, *sed squamis hypogynis instructa*; ramis *cicatricatis*; foliis *suberectis, minutissime serrulatis*; capitulis *florum parvis*.

Pilitis is distinguished from *Cystanthe* by the presence of hypogynous scales; in all other important characters it agrees with that genus, as it does also in habit, stature, and general appearance. Flowers collected into terminal heads: these consist of much-abbreviated spikes of densely imbricating bracts and flowers. *Flowers* sessile, with one large general bract, and three or four smaller ones at the base of the calyx. *Sepals* subfoliaceous, ovate-lanceolate, acute, about as long as the mitriform corolla. *Filaments* slender; anthers oblong. (Name from πιλεος, *a cap*; in allusion to the form of the corolla.)

1. **Pilitis acerosa** (Lindl. Nat. Syst. Bot. 443); fruticulus ramosus, ramis foliosis, foliis ($\frac{1}{2}$-uncialibus) acute imbricatis subulatis erectis, capitulis exsertis, filamentis brevibus, squamulis hypogynis ovario æquilongis in lacinias 2 erectas subulatas alte fissis.—*DC. Prodr.* vii. 769. (*Gunn*, 307.) (Tab. LXXXII.)

Hab. Arthur's Lakes, and summits of the Western and other Mountains, *Lawrence, Gunn.*—(Fl. Jan.)

Very similar to *Cystanthe sprengelioides*, but may be distinguished at once by the narrower suberect leaves and much smaller flowers, which form terminal capitula about $\frac{1}{3}$ inch long. *Stems* 2 feet high. *Branches* annulate. *Leaves* $\frac{1}{3}$—$\frac{1}{2}$ inch long, with membranous margins towards the base. *Flowers* white. *Calyx* with three appressed imbricating bracts at the base. *Sepals* broadly ovate, acute, as long as the corolla. *Anthers* long. *Hypogynous scales* longer than the ovary, rather membranous, deeply cut into two subulate laciniæ.—Plate LXXXII. Fig. 1, leaf; 2, flower and bracts; 3, corolla; 4, bracts and flower, with corolla fallen away; 5, base of corolla, pistils, and stamens; 6, stamen and hypogynous glands; 7, pistil and scales; 8, transverse, and 9, vertical section of ovary:—*all magnified.*

2. **Pilitis Milligani** (Hook. fil.); fruticulus erectus ramosus, ramis nudis, ramulis apice foliosis, foliis (uncialibus) late subulato-lanceolatis erecto-patentibus, capitulis foliis immersis, filamentis elongatis, squamulis hypogynis obovatis emarginatis. (*Gunn*, 2050.) (Tab. LXXXIII.)

Hab. Mount Sorrell, Macquarrie Harbour, elev. 3000 feet, *Milligan.*—(Fl. Jan.)

A very distinct species, having slender, naked branches, bearing at their apices leaves very like those of *Richea scoparia*, and having the flowers twice as large as those of *P. acerosa*, sessile amongst the leaves, and filaments half an inch long.—Plate LXXXIII. Fig. 1, portion of leaf; 2, bud; 3, corolla; 4, flower, with corolla removed; 5, base of corolla, scales, stamens, and pistil; 6, pistil and scales; 7, transverse, and 8, vertical section of ovary:—*all magnified.*

Gen. XVII. RICHEA, *Br.*

Calyx brevis, ebracteatus, 5-lobus v. 5-partitus. *Corolla* clausa, calyptræformis, transversim dehiscens, basi truncata persistente. *Stamina* hypogyna, persistentia. *Squamulæ* 5, hypogynæ. *Ovarium* 5-loculare; ovulis placentis e apice loculi pendulis affixis.—Frutices; ramis *annulatis, longe nudis, apice foliosis;* foliis *elongatis, rigide coriaceis, basi imbricatis, vaginantibus, amplexicaulibus, limbo apice pungente, marginibus scaberulis;* floribus *sessilibus pedicellatisve, in spicam v. racemum simplicem v. compositum dispositis;* pedicellis *basi bracteatis.*

One of the most remarkable genera of the Order, from the singular appearance of some of the species, and especially of the *R. pandanifolia* and *R. dracophylla;* it is very closely allied to the three preceding genera, and especially to *Pilitis* and *Cystanthe*, from both of which it differs in the paniculate or spicate inflorescence, and membranous, comparatively much smaller, ebracteate calyx, and from *Cystanthe* further, in the presence of hypogynous glands. The corolla, which is calyptrate, is sometimes minutely five-lobed at the apex. All the species are Tasmanian, and only one of them is found on the mountains of the Australian continent; they are represented in New Zealand and New Caledonia by the genus *Dracophyllum*, of which one peculiar species is found in New South Wales, and which differs only in the corolla being five-lobed. (Named in honour of *M. Riche*, one of the Naturalists in the voyage of D'Entrecasteaux, in search of La Peyrouse.)

1. **Richea pandanifolia** (Hook. fil. Fl. Antarct. i. 50, *in nota*); subarborea, trunco simplici gracili, foliis longissimis flexuosis ensiformibus margine denticulatis, paniculis lateralibus glabris pedunculatis densifloris ovatis ramosis, pedunculo basi bracteis equitantibus chartaceis lanceolatis appressis tecto, floribus parvis pedicellatis, calycibus 5-lobis obtusis, filamentis brevibus. (*Gunn*, 1215.) (Tab. LXXXIV. *et* LXXXV.)

Hab. Dense mountain forests in the interior, southern, and western parts of the Colony, as Frenchman's Cap, Peak of Teneriffe, Port Davy, and Lake St. Clair, *Backhouse, Gunn.*—(Fl. Jan.)

This presents a more striking appearance than any other Tasmanian plant, its long, naked, slender, annulate stems attaining a height of 36 feet, and bearing one or several huge crowns of long waving leaves, often rising

far above the surrounding vegetation, strikingly resembling in general aspect the mountain *Pandani* of India, or an *Aloe* on the end of a pole.—*Trunk* 9 inches in diameter, with a large pith, sometimes branching. *Leaves* at the summit of the stem only, densely crowded, extremely rigid and coriaceous, 3–5 feet long, shining and amplexicaul at the sheathing base; margins toothed and cartilaginous. *Panicles* compound, axillary, 4–6 inches long, at first hidden by lanceolate, distichous, equitant, spathaceous bracts, 2–6 inches long, which are successively cast off as the compressed peduncle elongates. *Flowers* very small, $\frac{1}{4}$ inch long, on short pedicels. *Calyx* short, blunt. *Capsules* $\frac{1}{8}$ inch across, with short persistent styles. *Hypogynous scales* short, much broader than long, obscurely lobed.—Gunn remarks that the undeveloped panicles attain a considerable size several years before they are destined to flower, and that after fruiting they persist for some years more.—PLATES LXXXIV. and LXXXV. *A*, reduced sketch of entire plant; *B*, young leaf and inflorescence; *C*, expanded inflorescence; *D*, young leaf-bud; *E*, old leaf:—*all of nat. size.* Fig. 1, portion of leaf; 2, flower; 3, same, with corolla removed; 4, stamens and pistil; 5, stamen; 6, pistil and hypogynous scales; 7, longitudinal, and 8, transverse section of ovary; 9, fruit:—*all magnified.*

2. **Richea dracophylla** (Br. Prodr. 555); subarborea, caule ramoso, foliis (pedalibus) e basi vaginata longissime lanceolatis margine scaberulis, paniculis terminalibus elongatis contractis puberulis, floribus longiuscule pedicellatis, calycibus minimis, filamentis elongatis.—*Guill. Ic. Lith. t.* 3; *DC. Prodr.* vii. 769. (*Gunn*, 517.)

HAB. Mount Wellington, elev. 3000 feet, *Brown, etc.*—(Fl. Oct.) (*v. v.*)

A singular and very beautiful plant, attaining a height of 10–12 feet on the wooded slopes of Mount Wellington, but as it ascends assuming a dwarf character.—*Stems* naked, sparingly branched. *Leaves* numerous, at the ends of the branches, 1–2 feet long, $\frac{1}{2}$–$\frac{2}{3}$ inch broad, flexuous; margins scaberulous. *Panicles* terminal, nodding, contracted, a foot long, 3 inches broad, with deciduous, large, rigid, sheathing bracts, that have broadly-ovate bases, and long, slender, rigid apices. *Peduncle* and rachis puberulous. *Pedicels* slender. *Flowers* $\frac{1}{3}$ inch long. *Calyx* very small, five-lobed. *Corolla* clavate, white and pink. *Anthers* very long. *Fruit* small.

3. **Richea Gunnii** (Hook. fil. in Lond. Journ. Bot. vi. 273); fruticulus erectus, foliis (uncialibus) subsquarroso-recurvis lanceolato-subulatis acuminatis pungentibus marginibus brevibus, spica terminali erecta elongata, floribus parvis in ramulos abbreviatos subsessilibus, calycibus 5-partitis segmentis late ovatis corolla latiuscula $\frac{1}{2}$ brevioribus, filamentis gracilibus. (*Gunn*, 859.) (TAB. LXXXVI.)

HAB. Summit of Mount Wellington and the Western Mountains, elev. 4–5000 feet, *Gunn.* (*v. v.*)

DISTRIB. Mountains of Victoria, elev. 5–6000 feet, *Mueller.*

A small, rigid, erect species, 1–5 feet high, much resembling in foliage, etc., *Cystanthe sprengelioides*, but readily distinguished by its terminal paniculate inflorescence. *Leaves* imbricating, $\frac{3}{4}$–$1\frac{1}{2}$ inch long; margins quite smooth, or (under a lens) very minutely scaberulous. *Panicles*, or compound spikes, erect, 3–10 inches long, puberulous, when young covered with short, broad, imbricating bracts. *Flowers* shortly-pedicelled, upon very short lateral branches. *Calyx* quinquepartite; segments broadly-ovate, half as long as the short tinged corolla, which is about $\frac{1}{4}$ inch long. *Hypogynous scales* rounded, truncate.—This is readily distinguished from *R. dracophylla* by the small-sized leafy branches, short leaves with smooth margins, slender, erect spikes, and much smaller flowers, with calyces half the length of the corolla. Mueller's specimens from the Australian Alps have very long spikes, and rather larger flowers. In the 'London Journal of Botany' I have erroneously considered this to be the alpine state of *R. dracophylla*, to which Brown alludes in his 'Prodromus,' and which is, I suspect, the following.—PLATE LXXXVI. Fig. 1, flower; 2, stamens and pistil; 3, stamen; 4, ovary and scales; 5, transverse, and 6, longitudinal section of ovary:—*all magnified.*

4. **Richea scoparia** (Hook. fil. in Lond. Journ. Bot. vi. 273); fruticulus erectus robustus, foliis suberectis dense imbricatis (1–2-uncialibus) strictis recurvisve lanceolatis subulatisve marginibus scaberulis,

panicula terminali erecta contracta, floribus brevissime pedicellatis, pedicellis bracteolis parvis linearibus membranaceis deciduis instructis, calyce parvo 5-lobo corolla multoties breviore, filamentis gracilibus.—*Hook. Ic. Plant. t.* 850. *An* R. dracophyllæ *varietas alpina, Br.? Prodr.* 555. (*Gunn,* 292, 2049.)

Hab. Summit of Mount Wellington, Mount Sorrell, Valentine's Peak, Surry Hills, etc., elev. 3000–4000 feet, *Lawrence, etc.*—(Fl. Dec., Jan.) (*v. v.*)

This, I assume, is the small variety of *R. dracophylla*, to which Brown alludes as being only 1½ foot high, and growing at the top of Mount Wellington. If it be really a variety of that plant (which Gunn does not conceive to be possible), it is singular that it should be so common on the Tasmanian mountains, where *R. dracophylla* does not exist. What differences there are between them reside chiefly in size and habit, this being only one to five feet high, and having very robust branches, covered with closely-imbricating, erect or recurved, rigid, narrow (sometimes subulate) leaves, 1½–3 inches long. The flowers are the same with those of *R. dracophylla*, and vary from white to pink and orange-coloured. Gunn says that this is not a variable species, but retains its habit and character as well in exposed as sheltered situations; it always forms a very dense bush, and it is called the "Honey-plant."

Nat. Ord. L. OLEINEÆ.

The few genera of this Natural Order inhabiting Australia are *Olea, Chionanthus,* and *Notelæa,* including together about ten species, all inhabiting the eastern half of the continent, and extending from the north coast to Tasmania. Some form large trees, and several New South Wales species of *Notelæa* yield valuable timber.

Gen. I. NOTELÆA, *Vent.*

Calyx minimus, 4-dentatus. *Petala* 4, basi inter se ope staminum per paria cohærentia, concava. *Stamina* 2; filamentis dilatatis; antheris adnatis. *Ovarium* 2-loculare; loculis 2-ovulatis; ovulis ex apice septi pendulis. *Stigma* subsessile, emarginato-bilobum. *Drupa* carnosa; putamine chartaceo, 1-loculari, bipartibili, abortu 1-spermo. *Semen* pendulum; embryone in axi albuminis carnosi recto; cotyledonibus foliaceis; radicula brevi, supera.—Frutices *v.* arbores; ramis *teretibus;* foliis *oppositis, integerrimis;* floribus *parvis, axillaribus, corymbosis.*

Almost exclusively an Australian genus, consisting of six or seven species of shrubs or trees, with opposite, quite entire, coriaceous leaves, and axillary corymbs of minute green flowers.—*Calyx* minute, four-cleft. *Stamens* two, short, placed between the petals, which cohere at their bases in pairs. *Ovary* two-celled, with two pendulous ovules in each cell. *Fruit* a drupe, with an oblong, hard, bipartite, coriaceous nut, containing one to four pendulous, albuminous seeds.—The *N. ligustrina* forms a bush 6–8 feet high, or more rarely a small tree of 30 feet. *Branches* slender. *Leaves* coriaceous, petioled, lanceolate, acute or obtuse, opaque on both surfaces. *Flowers* in corymbose panicles, shorter than the leaves. *Pedicels* slender. *Calyx*-lobes acute. *Drupes* oblong, purple, two to four-seeded, varying in colour from white to pink and purple. (Name from νοτος, *the south,* and ελαια, *an olive.*)

1. **Notelæa ligustrina** (Vent. Choix, 25); foliis lanceolatis opacis subtus punctatis, calycis lobis acutis.—*Br. Prodr.* 524; *DC. Prodr.* viii. 291. (*Gunn,* 374.)

Hab. Common by banks of rivers, and on the skirts of woods.—(Fl. Feb.) (*v. v.*)

Distrib. South-eastern Australia, New South Wales, and Victoria.

Nat. Ord. LI. APOCYNEÆ.

Of this extensive Order comparatively very few (about thirty) Australian species are known; these, with the exception of *Lyonsia* and *Alyxia,* are almost confined to the tropics, and chiefly to the north-east

coast. Of the closely-allied Order *Asclepiadeæ* there are no Tasmanian species, but about thirty continental Australian, of which one or two only are extratropical.

Gen. I. ALYXIA, *Banks.*

Calyx 5-partitus, eglandulosus. *Corolla* hypocrateriformis, tubo apice constricto, intus piloso, fauce nuda. *Stamina* inclusa. *Ovaria* 2, oligosperma, stylo unico; stigmate obtuso. *Drupæ* 2 (altera sæpius abortiente), stipitatæ, oblongæ v. catenatim compositæ. *Semina* solitaria v. plura, superposita, facie interna compressa suturam ventralem ambientia ideoque longitudinaliter sulcata. *Albumen* ruminatum, corneum. —Arbusculæ *v.* frutices *lactescentes, erecti v. scandentes;* foliis *sæpius ternis quaternisve, sempervirentibus, glabris;* floribus *axillaribus terminalibusve, solitariis cymosisve.*

About twenty species of *Alyxia* are known, chiefly inhabitants of India, Polynesia, and Australia, in which latter country eight have been found; they are erect or subscandent evergreen shrubs, with usually ternate or verticillate leaves, and white, odorous, solitary or cymose flowers. The genus is distinguished by the salver-shaped corolla, with its tube constricted at the mouth; the two ovaries have combined styles, and ripen into one or two fleshy drupes, containing one or more seeds, that are compressed and so curved as to appear bipartite, and have a ruminated albumen.—The Tasmanian species is a prostrate or subscandent glabrous shrub, 3–5 feet high, with scented wood, angled branches, and elliptical or obovate, coriaceous, shortly petiolate, opposite leaves, about an inch long, with narrow, recurved margins, very obscure veins, and a short apiculus. *Flowers* ½ inch long, white, fragrant, generally in pairs, on short pedicels rising from the branch between the petioles. *Drupes* solitary or in pairs, each one-seeded, simple, and almost spherical, or many-seeded, with the seeds in one or two rows, and the fruit much constricted between each seed, whence it resembles a necklace. (Name from αλυσις, *a chain;* in allusion to the occasional constriction of the drupe.)

1. **Alyxia buxifolia** (Br. Prodr. 470); frutex, foliis oppositis ellipticis obovatisve breve petiolatis obtusis aveniis, floribus subgeminatis interpetiolaribus, drupis solitariis binisve simplicibus et monospermis v. catenatim 2-polyspermis.—*DC. Prodr.* viii. 348. (*Gunn*, 378.)

Hab. Rocky places on the North coast, frequent at Circular Head, Georgetown, etc., *Frazer, Gunn.*—(Fl. Feb., March.)

Distrib. Southern coasts of Australia, from Port Phillip to Swan River; tropical Australia, *Brown.*

Gen. II. LYONSIA, *Br.*

Calyx 5-partitus, lobis basi intus glanduliferis. *Corolla* 5-fida, pubescens, tubo esquamato, lobis lanceolatis intus retrorsum barbatis. *Stamina* 5; filamentis in tubum approximatis; antheris medio stigmati adhærentibus, basi caudatis. *Discus hypogynus* 5-fidus, glaber. *Ovarium* disco immersum, glabrum, 2-loculare; ovulis numerosis; stylo unico, stigmate subbilobo, basi annulo horizontali cincto. *Fructus* capsularis, cylindraceus, bilocularis, valvis folliculiformibus, dissepimento parallelo libero utrinque seminifero, placentis adnatis; seminibus comosis.—Frutices *volubiles;* foliis *oppositis;* cymis *trichotomis;* floribus *parvis.*

Only four or five species of this genus are known, chiefly natives of extratropical Australia, one being New Caledonian; all form large climbers, with slender twining stems, opposite, petioled, generally lanceolate leaves, and terminal or axillary small white flowers, in branching trichotomous cymes. The genus is characterized by the quinquefid calyx, with glands at the base of the lobes internally; the quinquefid pubescent corolla, with the lobes bearded backwards, and the throat without scales; the five stamens adhering to the stigma, and having their anther-cells produced below into long tails, empty of pollen; and the two-celled ovary ripening into a long two-celled capsule, with comose seeds. The Tasmanian *L. straminea* is an immense climber, scaling trees 30–40 feet high, and its pendu-

lous whip-like branches rooting when they reach the ground.—*Stems* 2 inches in diameter; inner bark silky and very strong, useful as a substitute for hemp. *Leaves* opposite, glabrous, petiolate, lanceolate, acuminate, 2–3 inches long, very dark green. *Flowers* ¼ inch long, dull yellow, in many-flowered cymes. *Fruit* 3 inches long, ripening at the same time as the flowers of the following season open. (Named in honour of *Israel Lyons*, a Cambridge collector of plants.)

1. **Lyonsia straminea** (Br. Prodr. 466); foliis lanceolatis longe acuminatis, cymis pubescentibus. —*Alph. DC. Prodr.* viii. 401. (*Gunn*, 44.)

Hab. Northern parts of the Island, in deep, shaded ravines, etc.; Circular Head and Launceston, *Gunn.*—(Fl. Dec.)

Distrib. South-eastern Australia.

Nat. Ord. LII. GENTIANEÆ.

Seven* genera of this Order have been found in Australia and Tasmania, namely, *Gentiana*, *Erythræa*, *Sebæa*, and *Orthostemon*, together with the somewhat anomalous genera *Villarsia*, *Limnanthemum*, and *Liparophyllum*. Of these none except the last are peculiar to Australia, and they together include about a dozen species.

Gen. I. SEBÆA, *Soland.*

Calyx 4–5-partitus; lobis carinatis v. alatis. *Corolla* 4–5-fida, marcescens. *Stamina* exserta. *Antheræ* longitudinaliter dehiscentes, defloratæ subtortæ, apice calloso recurvo. *Stigmata* 2. *Capsulæ* valvæ margine inflexæ. *Semina* plurima, axi centrali libero affixa.—Herbæ *annuæ?*; caulibus *simpliciusculis*.

Besides the Tasmanian *S. ovata*, there is one Australian species of this genus, the *S. albidiflora*, Mueller, of Victoria, and about a dozen others, all natives of South Africa.—The *S. ovata* is a slender, annual herb, with an erect, four-angled stem, 2–6 inches high, simple or dichotomously branched above, with a flower placed at each fork. *Leaves* ¼ inch long, sessile, very broadly ovate, blunt. *Flowers* few, clustered at the tops of the branches, ¼ inch long, yellow. *Calyx*-lobes ovato-lanceolate, acuminate, keeled. *Corolla* with a straight tube, and five oblong blunt lobes, that are twisted after the flower is closed. *Stamens* five, with very short filaments, placed at the mouth of the corolla. *Anthers* slightly twisted after flowering. *Ovary* two-celled, with two straight styles and small capitate stigmas. *Capsule* of two linear, concave, pointed valves, that separate from a central axis, bearing numerous seeds. (Named in memory of *Albert Seba*, an Amsterdam apothecary and author.)

1. **Sebæa ovata** (Br. Prodr. 452); caule simplici superne ramoso gracili 4-gono, foliis late ovatis obtusis, calycis lobis carinatis, floribus 5-fidis.—*DC. Prodr.* ix. 53; *Fl. N. Zeal.* i. 172. Exacum ovatum, *Lab. Nov. Holl.* i. 38. *t.* 52. (*Gunn*, 718.)

Hab. Common in pasture-lands at Circular Head and Launceston, *Lawrence, Gunn;* Port Arthur, *Backhouse.*—(Fl. Nov.)

Distrib. New South Wales, Victoria, and Swan River; New Zealand.

Gen. II. ERYTHRÆA, *Renealm.*

Calyx 4–5-fidus. *Corolla* infundibuliformis, limbo supra capsulam marcescente. *Stamina* 4–5, an-

* *Ophelia* has also been regarded as Australian, from Ceylon specimens of *O. Zeylanica* having been erroneously ticketed as from King George's Sound, and described as *O. Baxteri.* The fimbriated scale, which is accurately described by Grisebach in De Candolle's 'Prodromus' as covering the nectarial pits of *O. Baxteri*, is present also in *O. Zeylanica*, though not alluded to in that work.

theris exsertis tortis. *Ovarium* uni- v. semi-biloculare; stylo deciduo; stigmatibus rotundatis. *Capsula* bivalvis, placentis spongiosis. *Semina* placentæ immersa, minuta.—Herbæ *annuæ;* caule *subangulato;* foliis *basi connatis.*

A European genus, containing also several North and South American, Asiatic, African, Polynesian, and Australian species, distinguished from *Sebæa*, which it resembles in habit, by the twisted anthers and unilocular ovary. *E. australis* is the only Australian species, and forms a slender, erect herb, a foot high, with oblong, blunt, three-nerved leaves, and numerous subsecund, almost sessile, spiked, pink flowers. *Calyx* about the length of the tube of the corolla; tube elongated, limb four-cleft. *Corolla*-lobes very narrow. (Name from ερυθρος, *red;* in allusion to the colour of the flowers.)

1. **Erythræa australis** (Br. Prodr. 451); caule stricto ramoso, foliis oblongis obtusis 3-nerviis, floribus subsecundis subsessilibus, corolla 5-fida lobis angustis.—*Grisebach in DC. Prodr.* viii. 60.

Hab. Wet saline marshes on the banks of the Tamar, *Gunn.*

Distrib. Australia, from the tropics to Victoria and Swan River; Isle of Pines.

Gen. III. GENTIANA, *L.*

Calyx 4–5-fidus. *Corolla* infundibuliformis v. hypocrateriformis, 4–5-fida. *Stamina* 4–5; antheræ non tortæ, connectivo instructæ. *Ovarium* 1-loculare; stylo brevi v. 0; stigmatibus persistentibus. *Capsula* 1-locularis, bivalvis; semina placentis immersa, immarginata.—Herbæ *perennes, rarius annuæ, plerumque amaræ;* foliis *oppositis;* floribus *speciosis, in sp.* Tasmaniæ *purpurascentibus v. cæruleis rarius flavescentibus.*

A very extensive genus of beautiful herbaceous plants, abounding in the Alps of Europe, the Himalaya, and especially in the Cordillera of South America; also common in Northern and temperate Europe, but unknown in the Arctic regions; none are found in very hot climates, and a few species inhabit the South temperate zone, as the alps of Australia, Tasmania, and New Zealand, and the Antarctic islands of Lord Auckland's Group, Campbell Island and Fuegia. The species are usually very variable in stature and branching, and size and form of leaf and flower, the same species being low or tall, prostrate or erect, simple or branched, large- or small-flowered, also varying in the colour of the corolla, and size and form of the calyx-lobes.—Herbaceous plants, more or less bitter to the taste (especially the roots, which are frequently yellow in colour), and with simple or branched, erect or decumbent stems, with opposite, entire, exstipulate leaves, and dichotomous inflorescence. *Calyx* four- or five-lobed or -partite. *Corolla* funnel- or salver-shaped, with a spreading or erect four- or five-lobed limb. *Stamens* five, inserted on the corolla. *Ovary* one-celled, with marginal placentæ and very numerous ovules. *Stigma* two-lobed. *Capsule* two-valved. *Seeds* not winged. (Named in honour of *Gentius*, King of Illyria, who, according to Pliny, introduced the use of the root into medicine.)

1. **Gentiana montana** (Forst. Prodr. 133); annua, caule erecto simplici v. e basi ramoso, ramis erectis v. basi decumbentibus 1-floris v. laxe corymbosis, foliis radicalibus obovato-spathulatis obtusis, caulinis omnibus v. supremis tantum ovatis ellipticisve, pedunculis gracilibus, lobis calycinis lineari-subulatis linearibusve obtusis, corolla 5-fida campanulata v. infundibuliformi-campanulata, lobis oblongis.—*Br. Prodr.* 450; *Grisebach in DC. Prodr.* ix. 99; *Fl. N. Zeal.* i. 178. G. Grisebachii, *Nob. in Hook. Ic. Plant.* 636. (*Gunn*, 119, 1217.)

Var. β. *Diemensis;* caulibus 1–2-pedalibus gracilibus cyma corymbiformi laxa terminatis, corollæ rotatæ campanulatæ segmentis calycem paulo superantibus.—G. Diemensis, *Griseb. Gent.* 224; *DC. Prodr. l. c.* 90.

Var. γ. *pleurogynoides;* caule crassiusculo erecto e basi ramoso ramis apice corymbosis, floribus amplis, corolla calyce duplo longiore.—G. pleurogynoides, *Griseb. l. c.; DC. Prodr. l. c. p.* 99.

Hab. Abundant throughout the Island, growing in both wet and dry places, ascending to 4000 feet. (Fl. Oct.–Jan.) (*v. v.*)

Distrib. Mountains of New South Wales and Victoria; New Zealand.

A most abundant and extremely variable plant, amongst whose forms Mr. Gunn has hitherto found it impossible to distinguish more than one species. It is equally common and variable in New Zealand, where another species (or perhaps variety), *G. saxosa*, grows, which is only distinguishable by the perennial root. In the New Zealand Flora I have quoted *G. pleurogynoides* under *G. saxosa*, supposing that some of its more robust forms were perennial; but I now suspect that all the Tasmanian forms are truly annual.—A slender or robust herb, 6 inches to 2 feet high. *Stems* generally very numerous, and branching from the root, erect or ascending. *Radical leaves* rosulate, obovate-spathulate, blunt; cauline more ovate or elliptical. *Flowers* peduncled, ½–1 inch long, white or blue, or white and striped with blue, sometimes more or less pink-purple, or yellowish in the tube of the corolla. *Calyx*-lobes linear or linear-subulate. *Corolla* subrotate or broadly campanulate, sometimes hardly longer than the calyx, at others very much longer; its lobes narrow or broad.

Gen. IV. VILLARSIA, *Vent.*

Calyx 5-partitus. *Corolla* subrotata, limbo patente 5-partito, laciniis disco plano basi barbato v. squamuloso, marginibus æstivatione inflexis. *Stamina* 5. *Ovarium* 1-loculare, basi glandulis 5 instructum. *Stylus* 1. *Stigma* 2-lobum, lobis dentatis. *Capsula* unilocularis, bivalvis; seminibus exalatis, placentis suturalibus insertis.—Herbæ *perennes, palustres;* foliis *alternis, petiolatis, integris;* floribus *corymbosis.*

Four species of this genus are known, and are remarkably dispersed, two inhabiting Western North America, one the Cape of Good Hope, and one Australia. All are marsh plants, with alternate, petiolate, radical leaves.—*Calyx* five-parted: *Corolla* rotate, with a spreading five-parted limb, which is inflexed in æstivation. *Stamens* five, inserted on the corolla. *Ovary* with five hypogynous glands, one-celled, with two parietal placentæ and a persistent style. *Capsule* two-valved; seeds numerous.—The Tasmanian species varies from 6 to 18 inches in height, and has creeping rhizomes, and long-petioled leaves that are fleshy, orbicular, reniform, or cordate. *Flowers* in a panicle or cyme, yellow; segments of the corolla bearded at the base, and fringed at the margin. (Named in honour of *Dominique Villars*, an eminent French botanist.)

1. **Villarsia parnassiifolia** (Br. Prodr. 457); foliis longe petiolatis orbiculatis cordatisve carnosis integerrimis v. angulato-dentatis, ramis cymæ divaricatis v. ascendentibus, corollæ luteæ intus basi barbatæ segmentis margine fimbriatis intus ecristatis.—*Griseb. in DC. Prodr.* ix. 136. V. reniformis, *Br. l. c.* Swertia parnassifolia, *Lab. Nov. Holl.* i. 72. *t.* 97. Menyanthes exaltata, *Sims, Bot. Mag. t.* 1029. (*Gunn*, 717, 1216.)

Hab. Abundant in marshes and lakes, ascending to 3000 feet elevation.—(Fl. Nov.–Jan.)

Distrib. South-eastern and South-western Australia. (Introduced into England.)

Brown separates the reniform-leaved variety of this plant as *V. reniformis*, remarking that it is too nearly allied to *V. parnassiifolia*, which he further describes as a polymorphous plant. Gunn considers that these are two perfectly distinct species, and observes that one has floating leaves, and grows in lakes; the other has erect leaves, and grows in marshes only, near Georgetown, flowering a month earlier than the other. Gunn's two forms are not, however, Brown's; and a comparison of a numerous suite of Australian forms seems to leave no doubt that Grisebach is right in uniting them. The plants vary from 6 to 18 inches high, and the leaves from ½ to 2 inches long, and from broadly reniform to oblong-cordate.

Gen. V. LIPAROPHYLLUM, *Hook. fil.*

Calyx profunde 5-fidus. *Corolla* subrotata, limbo patente 5-partito, laciniis imberbibus disco plano

crasso marginibus undulatis. *Stamina* 5, filamentis brevibus; *glandulæ hypogynæ* 0. *Ovarium* 1-loculare, placentis 2 parietalibus, ovulis numerosis. *Fructus* indehiscens, subbaccatus. *Semina* plurima, suborbiculata, compressa (exemplaribus meis immatura); *testa* subcrustacea, crassiuscula.—Herba *pusilla, paludosa;* rhizomate *repente, fibras crassas emittente;* ramis *ascendentibus, brevibus, foliosis;* foliis *lineari-elongatis, carnosulis, basi subvaginantibus;* pedunculis *terminalibus, solitariis, brevibus,* 1-*floris;* floribus *albis.*

This remarkable little plant, first described in the 'London Journal of Botany,' from incomplete specimens, was placed by me in *Portulaceæ;* and I am indebted to M. Planchon for pointing out its true affinities, which are undoubtedly with *Villarsia* and *Limnanthemum*, differing from both in the absence of glands at the base of the ovary, and in the glabrous corolla, and further, from *Villarsia* in the not capsular fruit, and from *Limnanthemum* in the habit and foliage. *Liparophyllum Gunnii* is a very small herb, 1–2 inches high, resembling a dwarf state of *Claytonia Australasica.*—*Rhizomes* long, cylindric, branching, sending down long, very thick, simple fibres. *Stems* short. *Leaves* linear, 1 inch long, $\frac{1}{6}$ broad, subacute, fleshy, quite entire. *Peduncle* shorter than the leaves, terminal, erect, one-flowered. *Flowers* about $\frac{1}{3}$ inch diameter. *Calyx*-lobes five, acute. *Corolla* short; lobes five, oblong, blunt, with a thick fleshy disc, and undulated, broad, membranous margins. *Fruit* globose; seeds numerous, compressed, nearly orbicular, bright yellow. (Name from λιπαρος, *fat*, and φυλλον, *a leaf.*)

1. **Liparophyllum Gunnii** (Nob. in Lond. Journ. Bot. vi. 472). (Tab. LXXXVII.)

Hab. Wet sandy soil on the margins of alpine lakes, *Gunn.*—(Fl. Dec.)

Plate LXXXVII. Fig. 1, leaf; 2, flower; 3, calyx, laid open; 4, stamen; 5, ovary; 6 and 7, longitudinal, and 8, transverse sections of ditto; 9, unripe fruit, unripe seed:—*all magnified.*

Nat. Ord. LIII. LOGANIACEÆ.

The plants constituting this Order have been lately ably discussed in the 'Journal of the Linnean Society' by Bentham, who has shown that they are an artificial assemblage of anomalous members of *Rubiaceæ, Gentianeæ, Scrophularineæ,* and *Apocyneæ.*

The Australian species (about forty-five in number) all belong to the genera *Logania, Mitrasacme,* and *Strychnos;* of these Bentham has shown that the affinities of *Logania* are with *Scrophularineæ* rather than with *Rubiaceæ* or *Apocyneæ;* that *Mitrasacme* corresponds with the tribe *Hedyoteæ* of *Rubiaceæ* in many important particulars, but has the adhering stigmata of *Apocyneæ;* and that *Strychnos,* though having no exact parallel in *Rubiaceæ* and *Apocyneæ,* is allied to both. These plants are for the most part natives of the eastern coast, but several are tropical (including *Strychnos*), and some natives of the Swan River Colony.

Gen. I. MITRASACME, *Lab.*

Calyx 2–4-fidus. *Corolla* 4-partita, lobis valvatis. *Stamina* 4, filamentis gracilibus. *Ovarium* 2-loculare; ovulis placentis septo adnatis insertis; stylo basi bifido. *Capsula* subglobosa, 2-locularis, inter styli divisuras supra septum suturis ventralibus dehiscens. *Semina* rugulosa; albumine carnoso.—Herbæ *plerumque annuæ, graciles, glabræ v. pilosæ;* foliis *oppositis, integris, exstipulatis;* floribus *parvis, pedicellatis, axillaribus et umbellatis.*

A rather extensive genus, of which about twenty Australian and three Indian species are known. All are small, generally annual herbs, with opposite, entire, exstipulate leaves, and pedicelled, small, axillary, and umbellate flowers.—*Calyx* four- (rarely two-) cleft. *Corolla* with four valvate lobes. *Stamens* four, alternate with the lobes of the corolla. *Anthers* didymous or cordate at the base. *Ovary* two-celled, with two styles that diverge

below, and are frequently united by the stigmata. *Capsule* two-celled, few- or many-seeded, opening under the styles along the ventral suture. (Name from *μιτρα, a mitre,* and *ακμη, a flower.*)

1. **Mitrasacme paradoxa** (Br. Prodr. 454); erecta, ramosa, foliata, foliis lineari-lanceolatis, umbella terminali, calyce late bifido, stylis superne connatis, capsula inclusa.—*Alph. DC. Prodr.* ix. 11; *Benth. in Journ. Linn. Soc.* i. 91. M. divergens, *Nob. in Lond. Journ. Bot.* vi. 276. (*Gunn,* 720.) (Tab. LXXXVIII. *A*)

Hab. Not uncommon in poor land near the sea, at Circular Head and Georgetown, *Gunn.*—(Fl. Nov.)

Distrib. Victoria: King George's Sound and Swan River.

A small, slender, annual, glabrous, erect plant, with erect, wiry, branched, leafy stems, 2–4 inches high, small, lanceolate leaves, and comparatively large flowers on slender pedicels, with a bifid calyx.—Plate LXXXVIII. *A.* Fig. 1, flower; 2, the same, with calyx partially removed; 3, corolla, laid open; 4, stamen; 5, transverse, and 6, longitudinal section of ovary; 7, capsule:—*all magnified.*

2. **Mitrasacme distylis** (Ferd. Muell. MSS.; Benth. in Journ. Linn. Soc. i. 92); pusilla, decumbens, foliata, foliis linearibus oblongisve, calyce truncato subbifido corolla sublongiore, stylis brevibus, stigmatibus distinctis v. lævissime cohærentibus, capsula inclusa. (*Gunn,* 2019.) (Tab. LXXXVIII. *B.*)

Hab. Georgetown, *Gunn.*—(Fl. Oct.)

Distrib. Victoria, *Mueller.*

A very minute, decumbent species, with slender, filiform, leafy stem, long, slender pedicels, obconic, broad, bluntly bifid calyx, and generally free styles.—Plate LXXXVIII. *B.* Fig. 1, flower; 2, ditto, with the calyx partially removed; 3, corolla, laid open; 4, stamen; 5, ovary, with corolla partially removed; 6, fruit and calyx; 7, ditto, removed from calyx; 8, seed:—*all magnified.*

3. **Mitrasacme serpyllifolia** (Br. Prodr. 454); perennis, caule repente e basi ramosissima, ramis diffusis, foliis ovatis petiolatis ciliatis pedunculis axillaribus solitariis duplo longioribus, calycibus glabris, stigmate subindiviso.—*Alph. DC. Prodr.* ix. 11; *Benth. Journ. Linn. Soc.* i. 93. (*Gunn,* 278, 741.)

Hab. Sandy soil, Western Mountains, Hampshire Hills, Arthur's Lakes, Hobarton, etc., *Gunn.*—(Fl. Dec., Jan.)

Distrib. New South Wales, *Brown.*

Perennial, diffuse, prostrate, much branched, leafy, forming matted patches on the ground.—*Leaves* petiolate, ovate, ciliated, twice as long as the axillary peduncles, about $\frac{1}{4}$ inch long. *Calyx* four-cleft.

4. **Mitrasacme pilosa** (Lab. Nov. Holl. i. 36. t. 49); caule repente, ramis prostratis ascendentibus erectisve foliisque pilosis, foliis ovatis petiolatis ciliatis pedunculis axillaribus longioribus v. multoties brevioribus, calycibus 4-fidis hispidis.—*Br. Prodr.* 454; *Alph. DC. Prodr.* ix. 11. (*Gunn,* 742.)

Var. *Stuartii;* caulibus elongatis suberectis, pedunculis longissimis.—M. Stuartii, *Mueller.*

Hab. Common about Circular Head and Hobarton.—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and Victoria.

Much the largest and most robust Tasmanian species, hispid or pilose all over.—*Stems* prostrate, densely matted, leafy, 4–10 inches long; in var. *Stuartii* suberect or erect, and dichotomously branched. *Leaves* as in *M. serpyllifolia,* to which this is too nearly allied. *Peduncles* very short or much elongated, sometimes 2 inches long. *Calyx* quadrifid.

5. **Mitrasacme montana** (Hook. fil. MSS., Benth. in Journ. Linn. Soc. i. 93); humilis, ramosissima, diffusa, glabra, foliis obovatis subcarnosis, floribus terminalibus solitariis sessilibus, stylis distinctis, calyce 4-fido, capsula late triangulari compressa supra concava. (*Gunn,* 2018.) (Tab. LXXXVIII. *C.*)

Hab. In peaty soil on Mount Wellington and Black Bluff Mountain, *Gunn.*—(Fl. Feb.)

A very curious, perennial species.—*Stems* densely matted and quite prostrate, ½–2 inches long. *Leaves* obovate, coriaceous, narrowed at the base, subsessile, somewhat ciliated. *Flowers* sessile, terminal. *Calyx* deeply four-lobed; two lobes somewhat broader than the others. *Corolla* short. *Anthers* subsessile. *Styles* short, distinct. *Capsule* 2 lines broad, truncate, obscurely two-lobed, much compressed, concave on the summit from the inflexion of the margins of the carpels, four- to six-seeded.—PLATE LXXXVIII. *C.* Fig. 1, flower; 2, ditto, with corolla removed; 3, corolla laid open, showing the ovary; 4, fruit and calyx; 5, ditto, calyx removed; 6, vertical section of ditto:—*all magnified.*

NAT. ORD. LIV. CONVOLVULACEÆ.

A considerable number of plants of this Order inhabit Australia, but owing to the rapid fading of the corolla of many of the tropical species, they have been either neglected or preserved in a state unfit for examination; thus, of fifty-three species described in Brown's 'Prodromus,' many, especially of *Ipomœa* and *Convolvulus*, are unknown to us; and of about an equal number of which we have specimens, there are not a few that are undeterminable, partly owing to the briefness of the diagnoses in the 'Prodromus,' and partly to the specimens being in an imperfect state. Probably there are about sixty known Australian species, by far the greater majority of which are tropical, and some of them common to many parts of the globe. Amongst the most conspicuous of these are the *Calystegia Sepium* and *Soldanella*, which are found in almost all temperate regions of both the northern and southern hemispheres; *Cressa Cretica*, *Dichondra repens*, and several species of *Evolvulus*, which inhabit many tropical countries of the Old and New World; and lastly, various species of *Pharbitis*, *Ipomœa*, and *Batatas*, which are common East Indian and Polynesian plants. Altogether, fully one-third of the Australian *Convolvulaceæ* are found in other parts of the globe; and one genus alone, *Wilsonia*, is confined to that continent and Tasmania, and to the south and especially south-west coast.

Gen. I. CONVOLVULUS, *L.*

Calyx ebracteatus v. bracteis 2 parvis suffultus, 5-partitus. *Corolla* 5-loba, campanulata v. infundibuliformis, lobis plicatis. *Stamina* subæqualia, limbo corollæ breviora. *Ovarium* 2-loculare, loculis 2-ovulatis; stylo indiviso; stigmatibus 2 filiformibus. *Capsula* 2-locularis.—Herbæ *v.* suffrutices, *lactescentes, volubiles v. prostratæ;* foliis *alternis;* floribus *plerumque amplis.*

Only four or five Australian species of this genus are known: they are prostrate or rarely twining herbs, with generally milky juice, alternate leaves, and handsome, campanulate flowers.—*Calyx* five-lobed, with small bracts at its base or none. *Corolla* between infundibuliform and campanulate, with five broad lobes and a plicate æstivation. *Stamens* nearly equal, shorter than the limb of the corolla. *Ovary* two-celled, with four ovules, a simple style, and two linear stigmas. (Name, an ancient one, derived from the twining habit of the species.)

1. **Convolvulus erubescens** (Sims, Bot. Mag. 1067); caule volubili v. prostrato pilosiusculo, foliis hastatis tripartitisve lobis lateralibus incisis lobatisve intermedio elongato ovato v. lineari, pedunculis 1–3-floris, sepalis ovatis mucronatis, capsulis erectis nutantibusve, seminibus scabris.—*Choisy in DC. Prodr.* ix. 412; *Fl. N. Zeal.* i. 185. C. erubescens *et* C. angustissimus, *Br. Prodr.* 482. *An* C. remotus, *Br. l. c.?* (*Gunn*, 52, 721.)

HAB. Abundant in good soil throughout the Colony.—(Fl. Sept.–Nov.) (*v. v.*)

DISTRIB. Subtropical and temperate Australia; New Zealand; Mediterranean region, from Spain to Persia and North Africa?; temperate South America and the Andes?; South Africa?.

A very common and extremely variable plant, more or less pubescent.—*Stems* slender, 6–18 inches long.

Leaves petiolate, varying from narrow-linear to broadly oblong-cordate, and from quite entire to hastate, and deeply five- to seven-lobed or -partite, with long or short, narrow or broad segments. *Flowers* solitary, axillary, generally pink, very variable in size. *Pedicel* with two small bracts. *Sepals* orbicular. *Corolla* ¼–1 inch across.—I have in the New Zealand Flora alluded to the probable identity of this with some European forms of *Convolvulus*, as first suggested by Brown (Prodr. *l. c.*), who remarks that his *angustissimus* is perhaps not distinct from *erubescens*, which is itself too nearly allied to the European *C. althæoides* and *lanuginosa*. That *C. angustissimus* is the same with *C. erubescens* there can be no doubt, for many of our specimens have the leaves of both forms on one plant: and after a careful comparison with numerous suites of specimens of *C. althæoides*, I can find no character whereby to separate the Australian plant from it, except its usually broader and shorter sepals. There is also a South American plant, common (under several names) from Mexico to Chili, which will probably prove the same.

Gen. II. CALYSTEGIA, *Br.*

Omnia *Convolvuli*, sed *calyce* bracteis foliaceis incluso, *ovario* semibiloculari, *stigmatibus* obtusis, et *capsula* uniloculari.

There are four species of this genus in Australia, of which two are the Tasmanian ones here described, and the others are both natives of New Zealand also. The genus entirely resembles *Convolvulus* in habit and general appearance, but has the calyx hidden between two large, foliaceous bracts, the stigmata broader and blunt, the ovary incompletely bilocular, and the capsule unilocular. (Name, καλυξ, *a calyx*, and στεγος, *a covering*.)

1. **Calystegia Sepium** (Br. Prodr. 483); volubilis, caule glaberrimo v. puberulo, foliis oblongo-sagittatis acuminatis alte cordato-bilobis, lobis rotundatis angustatis lobatis truncatisve, bracteis obtusis acutisve, pedunculis angulatis plerumque petiolo duplo longioribus.—*Choisy in DC. Prodr.* ix. 433; *Fl. Ant.* ii. 328; *Fl. N. Zeal.* i. 183. Convolvulus Sepium, *Linn. Sp. Pl.* 218; *Engl. Bot. t.* 313. (*Gunn*, 55.)

Hab. Abundant in several parts of the Island, climbing over bushes in shaded places.—(Fl. Dec.)

Distrib. South-eastern and South-western Australia; New Zealand; St. Paul's Island (South Indian Ocean); Chili, Java, temperate Europe, North America, and Asia.

A very beautiful plant, as common in some parts of Tasmania as in England, where it is known as the Greater Bindweed, Bearbind, or Hedge-Lily. It may be recognized by its twining habit, large, oblong-sagittate, acuminate leaves, with deeply bilobed, cordate bases, and angled lobes, and its large, white or rose-coloured flowers. The root (rhizome?) is sometimes large and tuberous, considered poisonous in Europe, but eaten by the New Zealanders.

2. **Calystegia Soldanella** (Br. Prodr. 483 *in nota*); caule prostrato, foliis crassiusculis reniformibus sinu basi lato rotundato integris v. sinuato-lobatis, pedunculis teretiusculis, bracteis cordatis obtusis acutisve calyce æquilongis, capsulis magnis globosis, seminibus atris.—*Choisy in DC. Prodr.* ix. 433; *Fl. N. Zeal.* i. 185. C. reniformis, *Br. l. c.* Convolvulus Soldanella, *Linn. Sp. Pl.* 226; *Engl. Bot. t.* 314. (*Gunn*, 866.)

Hab. Near the sea, Circular Head.—(Fl. Jan.)

Distrib. Shores of South-eastern Australia, New Zealand, Norfolk Island; Europe and extratropical North and South America.

This is the Seaside Bindweed of England.—*Stems* prostrate, a few inches to 2 feet long. *Leaves* reniform, ½–2 inches broad. *Peduncles* solitary, one-flowered, nearly terete or angled. *Flowers* large, pale rose-purple. *Capsules* large; *seeds* black.

Gen. III. WILSONIA, *Br.*

Calyx monosepalus, urceolatus, 5-dentatus, 5-gonus. *Corolla* infundibuliformis, lobis 5 imbricatis. *Stamina* 5. *Ovarium* 1–2-loculare, 1–2-ovulatum; stylis 2, longe bifidis, stigmatibus capitatis. *Capsula*

disperma.—Suffruticuli *humiles, erecti v. prostrati, sericeo-pubescentes v. glabrati;* foliis *sparsis v. arcte imbricatis, parvis;* floribus *axillaribus terminalibusve, solitariis, sessilibus.*

A singular genus, some of the species of which resemble *Frankenia* in many important characters besides habit; all are natives of the south and south-western coasts of Australia and the north shore of Tasmania.—Small, woody or herbaceous, prostrate or suberect, glabrous or silky plants, with very small, scattered or imbricating leaves. *Flowers* small, solitary, sessile. *Calyx* ebracteate, urceolate, five-lobed and five-angled. *Corolla* funnel-shaped, with five imbricating lobes. *Stamens* five, included or exserted. *Ovary* two-celled, with one erect ovule in each cell, or one-celled with two ovules. (Named in honour of *John Wilson*, author of a Synopsis of British Plants.)

1. **Wilsonia humilis** (Br. Prodr. 490); suffrutex sericeo-tomentosus, ramosissimus, ramis prostratis diffusis, foliis dense distiche imbricatis crassiusculis cymbiformibus, floribus axillaribus, calyce tubuloso, corollæ tubo calyce æquilongo lobis oblongo-linearibus, staminibus fauce vix exsertis.—*Choisy in DC. Prodr.* ix. 450. Frankenia cymbifolia, *Hook. Ic. Pl. t.* 265. (*Gunn*, 661.)

Hab. Great Swan Port, *Backhouse.*

Distrib. South and south-western coasts of Australia, from Victoria to Swan River.

A small, prostrate, branched, woody, silky plant, with long, distichously-branched stems, covered with close-set, distichous, imbricating leaves.—*Leaves* boat-shaped, very concave, blunt, silky on both surfaces, 1½ line long. *Flowers* small, axillary, sessile. *Calyx* tubular, with six short, blunt teeth; silky inside and out. *Corolla* salver-shaped; tube as long as the calyx; lobes five, linear-oblong, with concave tips. *Anthers* scarcely exserted. *Ovary* flagon-shaped, one-celled, with two erect ovules. *Style* jointed on to the ovary, divided at the middle into two slender, capitate arms.

2. **Wilsonia Backhousiana** (Hook. fil. Lond. Journ. Bot. vi. 275); glaberrima, caule prostrato ramoso, ramis ascendentibus, foliis carnosis linearibus subacutis, floribus foliis longioribus, calyce oblongo corollæ infundibuliformis tubo calyce bis longiore, lobis lanceolatis acutis, staminibus longe exsertis, ovario biloculari. (*Gunn*, 662.)

Hab. Kelvedon, Great Swan Port, *Story, Backhouse.*

Distrib. South coast of Australia, from Port Phillip to Swan River.

A very different plant from *W. humilis*, and perhaps deserving of being considered another genus, but until the other species of *Wilsonia* are investigated this cannot be determined; it differs from *W. humilis* in habit and foliage, in the short, oblong calyx, in the long tube of the funnel-shaped corolla, which has long, lanceolate lobes, in the long, exserted filaments, and bilocular ovary.—A perfectly glabrous plant. *Root* woody. *Stems* very numerous, flexuose, much diffusely-branched. *Branches* a span long. *Leaves* fleshy, linear, ½–¾ inch long, blunt or subacute. *Flowers* longer than the leaves. *Calyx* quite glabrous externally, with five subulate teeth, bearded internally. *Ovary* generally bilocular, but I think the septum is not always complete. *Anthers* and stigmata black. —I have seen Melbourne specimens (from Adamson) with much shorter, almost oblong leaves.

Gen. IV. DICHONDRA, *Forst.*

Calyx 5-partitus. *Corolla* subrotata, limbo 5-partito plano. *Ovaria* 2, 2-sperma; stylis 2 basilaribus; stigmatibus capitatis. *Fructus* utriculi 2 monospermi.—Herba *parvula, pubescens v. sericea;* caule *prostrato;* foliis *alternis, reniformibus cordato-rotundatisve;* pedunculis *axillaribus, solitariis, unifloris;* floribus *inconspicuis, flavis.*

Dichondra repens, the Australian (and probably the only) species of the genus, is a small, creeping, often tufted, pubescent, villous or silky herb, with slender, prostrate stems, 3–10 inches long; alternate, petiolate, cordate, or reniform leaves, ½–1 inch broad, round or notched at the apex, quite entire.—*Peduncles* solitary, axillary, bractless, about as long as the petioles, one-flowered. *Flowers* yellow, small. *Calyx* five-parted. *Corolla* rotate; limb about

as long as the calyx, flat, five-lobed. *Ovaries* two, each with two ovules, one basal style, and a capitate stigma. *Fruit* of two membranous, indehiscent, one-seeded utriculi. (Name from δις, *two*, and χονδρος, *a seed*.)

1. **Dichondra repens,** *Forst. Gen.* 39. *t.* 20; *Br. Prodr.* 491; *Choisy in DC. Prodr.* ix. 451; *Fl. N. Zeal.* i. 185. (*Gunn,* 398.)

Hab. Abundant in many parts of the Island.—(Fl. all summer.) (*v. v.*)

Distrib. Temperate and tropical Australia; New Zealand; India; South Africa; and North and South America.

Gen. V. CUSCUTA, *L.*

Calyx 4–5-fidus. *Corolla* marcescens, urceolata v. globosa, limbo 4–5-fido. *Stamina* 4–5; squamæ epipetalæ filamentis oppositæ, rarius 0. *Ovarium* 2-loculare, loculis 2-ovulatis; stylis 2, interdum coadunatis. *Capsula* bilocularis, indehiscens v. circumscissa. *Semina* albuminosa; *embryone* spirali indiviso.—Herbæ *aphyllæ, volubiles, parasiticæ;* floribus *aggregatis.*

A very large genus of tropical and temperate-country plants, of which only two Australian species are known, one of them tropical, and the other extending from the tropics to Tasmania.—Very remarkable, twining, parasitical, leafless plants, known as Dodders in England, where they do great injury to crops of Clover, etc., with slender, thread-like stems, that derive their nourishment by suckers from the plants to which they become attached; the seeds germinate in the ground by means of a spiral, undivided embryo, and the young plant, when fully developed, decays away near the root, and continues thenceforth to live wholly on the plant it has attached itself to.—*Flowers* rather small, in heads or clusters, whitish and transparent. *Calyx* four- or five-lobed. *Corolla* urceolate, four- or five-lobed. *Stamens* four or five, epipetalous, generally subtended by small scales. *Ovary* two-celled, cells two-ovuled; styles two, sometimes combined. *Capsule* indehiscent or bursting transversely.—The Tasmanian *C. Australis* is distinguished by its very slender stems, like matted packthreads; small flowers, about $\frac{1}{6}$ inch long; smooth, deeply five-lobed calyx; subcampanulate corolla, with five short, recurved lobes; the connate, fimbriated scales beneath, but attached to the dilated filaments; and the two styles with capitate stigmata. (Name of doubtful origin.)

1. **Cuscuta Australis** (Br. Prodr. 491); caule filiformi, racemis dense congestis 4–8-floris, calyce brevi profunde 4-lobo, corolla subcampanulata glandulis linearibus notata, filamentis dilatatis, squamis late oblongis obtusis fimbriatis basi membrana brevissime cohærentibus, stylis 2, stigmatibus capitatis.—*Choisy in DC. Prodr.* ix. 459; *Fl. N. Zeal.* i. 186. (*Gunn,* 1991.)

Hab. Near Hobarton and at Georgetown, *Gunn.*

Distrib. Tropical and South-eastern Australia; New Zealand.

Nat. Ord. LV. BORAGINEÆ.

An extensive Indian and South-European Natural Order, sparingly represented in other parts of the globe. The Australian genera are none of them peculiar, and contain only about twenty species, which are scattered over various parts of the continent.

Gen. I. MYOSOTIS, *L.*

Calyx 5-partitus v. 5-fidus. *Corolla* hypocrateriformis v. campanulata, fauce fornicibus clausa; lobis 5, contortis. *Stamina* 5; antheris peltatis, apice subappendiculatis. *Stigma* capitatum. *Nuces* 4, ellipticæ, compressæ, lævissimæ, glaberrimæ, umbilico minimo donatæ. *Semina* albuminosa; radicula brevi; cotyledonibus obovatis crassis.—Herbæ *villosulæ v. substrigosæ;* foliis *alternis, integerrimis, radicalibus petiolatis, caulinis plerumque sessilibus;* racemis *scapioideis, bracteatis v. ebracteatis;* corolla *plerumque cærulea.*

A very large European and Asiatic genus, of which some species occur in various other parts of the world, and three or four in Australia. Some of these are as conspicuous as the "Forget-me-not," which belongs to this genus. I have followed Alph. De Candolle in uniting *Exarrhena* with *Myosotis*. The genus is distinguished by its quinquepartite or quinquefid calyx, salver-shaped corolla, with contorted lobes, and the throat closed by conniving scales; and by the four compressed, smooth and glabrous nucules, that are not perforated at the point of insertion: all are erect or suberect herbs, with spreading or appressed, rather rigid hairs, spathulate radical leaves, and long, bracteate or ebracteate, scorpioid racemes of rather small flowers, which often change colour with age. (Name from *μυς, a mouse*, and *ους, an ear;* from the appearance of the leaves.)

§ 1. *Corolla hypocrateriform. Stamens included.*

1. **Myosotis Australis** (Br. Prodr. 495); dense hispido-pilosa, caulibus e radice plurimis erectis, foliis oblongo-lanceolatis lineari-spathulatisve obtusis, floribus breve pedicellatis, pedicellis ebracteatis inferioribusve bracteatis, calyce 5-partito pilis uncinatis patentibus hispido, corolla hypocrateriformi, staminibus inclusis.—*DC. Prodr.* x. 110; *Fl. N. Zeal.* i. 201. (*Gunn*, 184, 722.)

Hab. Common everywhere, ascending to 4000 feet.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. Extratropical Australia, from New South Wales to Swan River; New Zealand?

A slender, erect, herbaceous, annual? plant, with spreading, rigid hairs on the stem, and more appressed ones on the foliage.—*Stems* branched at the base only; branches 6 inches to a foot high, sparingly leafy. *Lower leaves* ½–2 inches long, linear-spathulate or oblong-lanceolate, blunt, subacute, hispid on both surfaces; cauline ones shorter, sessile. *Racemes* 1–2 inches long. *Flowers* small, varying from yellowish or white to pale blue? *Calyx* densely hispid with spreading bristles that are hooked at the apex.

§ 2. Exarrhena.—*Corolla subinfundibuliform. Filaments exserted.*

2. **Myosotis** (**Exarrhena**) **suaveolens** (Br. Prodr. 495); caule erecto subramoso inferne patentim superne appresse piloso, foliis sessilibus decurrentibus lineari-oblongis utrinque substrigosis, racemis elongatis ebracteatis, pedicellis calyce 3–4-plo brevioribus in fructu patenti-reflexis, calyce 5-fido pilis uncinatis hispido, tubo corollæ infundibuliformi, antheris exsertis.—*DC. Prodr.* x. 111. Exarrhena suaveolens, *Br. Prodr.* 495; *A. Rich. Sert. Astrol.* 78. *t.* 29 (*mala*). (*Gunn*, 50.)

Hab. Abundant in a rich, light soil: Hobarton, Arthur's Lakes, ascending to 2000 feet.—(Fl. Nov.)

Distrib. South-eastern Australia, from New South Wales to Victoria.

A much larger plant than *M. Australis*, stouter, with the stem often branched above.—*Stems* covered with spreading hairs. *Leaves* 1–3 inches long, sessile, linear-lanceolate or linear-oblong, acute or acuminate, pilose on both sides with short appressed hairs. *Racemes* 1–3 inches long, simple or branched. *Pedicels* ebracteate, much shorter than the calyx. *Calyx* with appressed, shining hairs. *Corolla* large, ⅕–⅓ inch across, white or bluish.

Gen. II. CYNOGLOSSUM, *Tourn.*

Calyx 5-partitus. *Corolla* infundibuliformis, fauce fornicibus clausa, limbo 4-partito. *Stamina* inclusa. *Stigma* capitatum, subemarginatum. *Nuces* depressæ, columnæ centrali adnatæ.—Herbæ *erectæ v. prostratæ, sæpe hispido-pilosæ;* foliis *alternis;* racemis *ebracteatis v. bracteatis;* bracteis *interdum foliiformibus;* nucibus *sæpissime echinatis v. hispidis.*

A very extensive European, Oriental, and Indian genus, of which there are a few species in many other parts of the world, and three or four in Australia. As in *Myosotis*, the corolla is closed by scales, but it is distinguished from that genus by the (generally hispid or echinate) nuts being much depressed and adnate along the back to a central columnar receptacle. (Name from *κυων, a dog*, and *γλωσσα, a tongue;* in allusion to the rough surface of the leaves of many species.)

1. **Cynoglossum Australe** (Br. Prodr. 495); erectum, caule robusto simplici v. ramoso patentim piloso, foliis petiolatis anguste lanceolatis utrinque substrigosis, racemis simplicibus ramosisve, pedicellis brevibus ebracteatis v. inferioribus bracteatis, nucibus echinatis glochidiatis.—*DC. Prodr.* x. 151. (*Gunn*, 88, 525.)

Hab. Common in good dry soil.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. New South Wales and Victoria.

A tall, robust, erect, generally branching plant, 1–3 feet high, covered everywhere with short, white, rather rigid hairs, which are spreading on the stem and appressed on the leaves.—*Leaves* petiolate, the uppermost sessile; lower elongate-lanceolate, acuminate, 2–6 inches long, sometimes obscurely sinuate; upper shorter. *Racemes* simple or compound, much elongated. *Pedicels* as long as the calyx, ebracteate, or the lower sometimes bracteate. *Flowers* rather small, ¼ inch across, white or blue. *Nuts* depressed, covered on the outer face and margins with spreading, short, stiff bristles, barbed at the tips.—Some of Gunn's specimens may be referable to Brown's *C. suaveolens*, which is said to differ in the upper leaves being semiamplexicaul, and the racemes bracteate, and the spines on the fruit more regular and equal.

2. **Cynoglossum latifolium** (Br. Prodr. 495); procumbens, ramosus, caulibus elongatis gracilibus flaccidis pedicellis petiolis costaque folii subtus remote breviter aculeatis, foliis petiolatis late ovatis acutis superne asperis, pedicellis gracilibus elongatis extra-axillaribus, nucibus valde depressis breviter glochidiatis.—*DC. Prodr.* x. 156. (*Gunn*, 861.)

Hab. Circular Head, in very damp, shaded situations, *Gunn*.

Distrib. Victoria and New South Wales.

A very fine and peculiar species.—*Stems* flaccid, much branched, prostrate, several feet long, leafy, aculeate, with very small, distant, white, hooked aculei on the branches, petiole, midrib below, and pedicel. *Leaves* petioled, broadly ovate, acute, 1–2 inches long, often oblique at the base, glabrous below, rough on the upper surface. *Pedicels* very slender, spreading, rising from the branches, slightly curved. *Flowers* rather small. *Sepals* lanceolate-acuminate. *Nuts* much compressed, divaricating, cuneate, densely glochidiate.

Nat. Ord. LVI. LABIATÆ.

A very extensive Natural Family, of which upwards of 130 Australian species are known, belonging to about 20 genera; of these, 7 genera and all but 6 or 8 species are confined to extratropical Australia and Tasmania; about 20 species are tropical, and these include all the Australian species found in other countries, except *Prunella vulgaris;* of the remaining 110 species nearly an equal number inhabit the south-eastern and south-western quarters, very few indeed being common to both. The European genera *Mentha, Lycopus, Prunella, Scutellaria, Teucrium,* and *Ajuga* are confined to South-eastern Australia or Tasmania.

Gen. I. MENTHA, *L.*

Calyx campanulatus v. tubulosus, 5-dentatus. *Corolla* tubo inclusa, 2-labiata, limbo subæquali 5-fido. *Stamina* 4, æqualia, erecta, distantia; filamentis glabris; antherarum loculis parallelis. *Stylus* apice breviter bifidus. *Nuculæ* siccæ, læves.—Herbæ *odoræ;* verticillastris *sæpius multifloris;* bracteis *subulatis;* floribus *sæpissime purpurascentibus.*

The Tasmanian plants included by Bentham in this genus are small herbs, resembling *Micromeria* in habit, etc., but differing in the stamens and corolla. The genus is abundant in Europe and rare in the southern hemisphere; only five Australian species are known.—The generic characters are a tubular or campanulate, five-toothed

calyx. *Corolla* campanulate, with its tube included in the calyx, and a four-cleft, nearly equal limb. *Stamens* four, equal, erect, spreading. (Name, the *μινθα* of the Greeks.)

1. **Mentha Australis** (Br. Prodr. 505); caule erecto angulis scabris, foliis breve petiolatis ovatis lanceolatisve raro denticulatis glabris v. subtus canescentibus, verticillastris remotis axillaribus multifloris, pedicellis brevissimis, calyce longe tubuloso canescente fauce nudo dentibus subulatis, corollæ lobis oblongis superiore bifido.—*Benth. in DC. Prodr.* xii. 174. Micromeria Australis, *Benth. Lab.* 380. (*Gunn*, 529.)

Hab. Common in marshy places.—(Fl. Dec.) (Colonial name, Penny-royal.)

Distrib. Subtropical and temperate South-eastern Australia.

An erect, slender, sparingly-branched herb, 1–2 feet high, very strongly odorous.—*Stems* acute-angled, scabrid at the angles. *Leaves* petioled, ovate or lanceolate, 1 inch long, entire or toothed. *Whorls* axillary. *Flowers* pedicelled. *Calyx* very pubescent, nearly ¼ inch long.

2. **Mentha gracilis** (Br. Prodr. 505); caule gracili prostrato lævi v. pubescente, foliis petiolatis ovatis v. ovato-lanceolatis obtusis integerrimis pube minuta canescentibus, verticillastris 6–10-floris axillaribus, pedicellis brevibus, calyce longe tubuloso canescente fauce nudo dentibus subulatis, corollæ lobis obovatis superiore vix emarginato.—*Benth. in DC. Prodr.* xii. 174. M. Diemenica, *Spreng. Syst. Veg.* ii. 724. Micromeria gracilis, *Benth. Lab.* 380. (*Gunn*, 89, 529.)

Hab. In stony places, not unfrequent.—(Fl. Dec.)

A very slender species.—*Stems* short, prostrate, with long, graceful, sparingly branched, perfectly glabrous or pubescent, erect or inclined branches, 8–12 inches long. *Leaves* petioled, distant, ovate or ovate-lanceolate, blunt, ⅓–⅔ inch long, quite entire, dotted beneath. *Whorls* axillary, six- to ten-flowered. *Flowers* shortly pedicelled. *Calyx* tubular, 2 lines long, pubescent, with short teeth. *Corolla* pink, with obovate lobes.—This and the following are with difficulty distinguished, except by comparison, when the longer petioles of this easily characterize it.

3. **Mentha serpyllifolia** (Benth. in DC. Prodr. xii. 174); caule gracili glabriusculo, foliis brevissime petiolatis ovatis obtusis integerrimis, verticillastris axillaribus 2–4-floris, pedicellis brevissimis, calycis campanulati puberuli dentibus breviter lanceolatis intus villosis, corollæ lobo supremo breviter bifido.—Micromeria repens, *Nob. in Lond. Journ. Bot.* vi. 274. (*Gunn*, 558.)

Var. *β*; puberula, foliis late ovatis ovato-cordatisve calycibusque latioribus.—*Benth. l. c.* Micromeria affinis, *Nob. in Lond. Journ. Bot. l. c.* (*Gunn*, 864.)

Hab. Not uncommon in marshes, etc., in various parts of the Island, Hampshire Hills, Circular Head, and Woolnorth, *Gunn*. Var. *β*. Woolnorth.—(Fl. Dec.)

Distrib. King River, Victoria, *Mueller*.

A small, very slender, prostrate plant, much branched from the base.—*Branches* glabrous, 4–8 inches long. *Leaves* 4 lines long, nearly sessile, rather remote, ovate, blunt, quite entire, glabrous, punctate; in var. *β* broader and subcordate at the base. *Whorls* axillary, of few flowers. *Calyx*-tube campanulate, villous at the mouth.—In some stunted alpine specimens the whorls are terminal and the margins of the leaves revolute.

Gen. II. LYCOPUS, *Tourn.*

Calyx campanulatus, æqualis, 4–5-dentatus, fauce nuda. *Corolla* calycem vix superans, campanulata, æqualis, 4-fida. *Stamina* 2 superiora sterilia, filiformia, capitellata, corolla breviora; 2 inferiora longiora, fertilia, distantia; antheris loculis parallelis. *Stylus* apice bifidus, lobis complanatis, acutis. *Nuculæ* siccæ, læves, margine calloso incrassato, trigonæ, truncatæ, basi attenuatæ.—Herbæ, foliis *dentatis pinnatifidisve*; verticillastris *densis, axillaribus*; floribus *parvis, sessilibus*.

A European, North American, and North Asiatic genus, whose reappearance in the extreme south of the

Australian continent and in Tasmania is a very remarkable fact in botanical geography; I am moreover very doubtful whether it should not be referred to the English *L. Europæus*, which extends to the Himalaya Mountains, and under which Mr. Bentham once placed it as a variety, and he further remarks that it is still more closely allied to *L. sinuatus* of North America. It is indeed very probable that, as Bentham also says under the generic character in De Candolle's 'Prodromus,' out of the ten species he there enumerates, all may be referred to *L. Virginicus*, L., and *L. Europæus*, L.—A tall, erect, glabrous, leafy herb, 2–4 feet high. *Stem* quite glabrous or sparingly pilose. *Leaves* sessile, oblong or linear-lanceolate, coarsely, sharply toothed, glabrous or sometimes pubescent above, punctate beneath, 2–5 inches long. *Whorls* small, axillary, sessile, many-flowered. *Flowers* small, white. *Bracts* subulate, rigid. *Calyx* campanulate, four- or five-toothed. *Corolla* scarcely longer than the calyx, campanulate, quadrifid; segments nearly equal. Upper *stamens* included, sterile, with capitate apices; lower fertile. *Nucules* compressed, truncate, smooth, with thickened margins, narrowed at the base. (Name from λυκος, *a wolf*, and πους, *a foot;* in allusion to the appearance of the inflorescence.)

1. **Lycopus Australis** (Br. Prodr. 500); caule erecto glaberrimo v. parce hispidulo, foliis anguste lanceolatis grosse serratis glabris v. superne puberulis, calycibus 5-dentatis, bracteis subulatis, nuculis tubo calycis brevioribus.—*Benth. in DC. Prodr.* xii. 178. L. Europæus, *a*, argutus, *Benth. Lab.* 186. (*Gunn*, 400.)

Hab. Not uncommon in moist, shaded places, *Gunn.*—(Fl. Jan.)

Distrib. New South Wales and Victoria.

Gen. III. PRUNELLA, *L.*

Calyx tubuloso-campanulatus, reticulato-venosus, bilabiatus; labio superiore tridentato, inferiore bifido. *Corollæ* tubus amplus, ascendens, intus basi pilis squamisve annulatus, labio superiore galeato, inferiore dependente. *Stamina* exserta, filamentis basi edentulis apice breviter bidentatis, dente inferiore antherifero; antheris per paria approximatis, loculis divaricatis. *Stylus* glaber, bifidus, lobis acutis. *Nuculæ* siccæ, læves.—Herbæ *subsimplices;* verticillastris *dense spicatis, bracteatis;* bracteis *magnis, persistentibus;* corolla *cærulea.*

A small genus, consisting of only three species, of which the Tasmanian one is found in very many parts of the world; it forms a small, perennial-rooted herb, 2–6 inches high, with petiolate, oblong, entire or variously sinuate or toothed leaves.—*Stems* solitary or several from the root, erect or ascending, glabrous or more or less pubescent. *Leaves* petiolate, 1–2 inches long, oblong or ovate, entire or variously toothed or sinuate. *Whorls* arranged in terminal spikes, six-flowered, subtended by large, imbricating floral leaves or bracts. *Calyx* campanulate, two-lipped; upper lip three-toothed, lower trifid. *Corolla* blue, its tube longer than the calyx, ascending, two-lipped; upper lip arched, concave, lower three-lobed; lateral lobes deflexed, middle one crenate. *Stamens* all fertile; filaments toothed towards the apex. *Anthers* conniving; cells divaricating. *Style* bifid. (Name derived by Ray from *Breaune*, the German name of a complaint it was used to cure.)

1. **Prunella vulgaris** (Linn. Sp. Pl. 837); foliis petiolatis oblongis ovatisve integris dentatisve, calycis labio superiore dentibus aristatis.—*Br. Prodr.* 507; *Benth. in DC. Prodr.* xii. 410. (*Gunn*, 31.)

Hab. Common throughout the Island, by waysides, in pastures, etc.—(Fl. Dec.) (*v. v.*)

Distrib. New South Wales and Victoria; throughout Europe, North Africa, Northern and Western Asia, the Himalaya Mountains and Peninsula of India, China, Japan, temperate North America, and the Andes of Mexico, etc.

Gen. IV. SCUTELLARIA, *L.*

Calyx campanulatus, 2-labiatus; labiis integris, post anthesin clausis, labio superiore deciduo e sepalis

3 constante (sepalo superiore excluso squamæformi, lateralibus connatis), labio inferiore persistente. *Corolla* tubo longe exserto, bilabiata; labio superiore galeato tridentato, inferiore dilatato convexo, lobis lateralibus liberis v. cum labio superiore coalitis. *Stamina* exserta, omnia fertilia; antheris per paria approximatis ciliatis, staminum inferiorum dimidiatis, superiorum loculis cordatis subdivaricatis. *Stylus* lobo superiore brevissimo. *Nuculæ* siccæ, tuberculosæ, glabræ v. pubescentes.—Herbæ, *rarius* frutices; floribus *solitariis*: foliis *floralibus bracteatis, v. in spicam terminalem bracteatam dispositis.*

A very large genus, containing nearly 100 species, of which only two are Australian; the majority inhabit the mountains of tropical America. The genus is found in almost all parts of the temperate and tropical world, except in South Africa.—The Tasmanian *S. humilis* is a small, suberect, glabrous or puberulous, herbaceous plant, 4–16 inches long, with slender, ascending, square stems, and small, petiolate, broadly linear and axillary, solitary, pedicelled flowers. *Leaves* 3–4 lines long, broadly ovate-cordate, blunt, sinuate-crenate, punctate beneath. *Flowers* small, secund, on pedicels about as long as the petioles. *Calyx* smooth, two-lipped; upper lip deciduous, of three sepals, of which two lateral are combined, and the upper forms a flat scale on their back; lower lip persistent. *Corolla* blue, its tube longer than the calyx, two-lipped; upper lip arched, lower three-lobed, lateral lobes broad, middle the longest. *Stamens* four, all fertile. *Anthers* conniving in pairs. *Nucules* enclosed in the closed calyx before maturity, when the upper lip of the calyx falls away. (Name from *scutellum*, a shield; in allusion to the upper scale-like sepal.)

1. **Scutellaria humilis** (Br. Prodr. 507); glabra v. strigoso-pubescens, caule humili parce ramoso gracili, foliis breviter petiolatis late ovato-cordatis obtusis grosse crenatis, floribus parvis axillaribus oppositis secundis.—*Benth. in DC. Prodr.* xii. 427. (*Gunn*, 59.)

Hab. Very common in rich soil in the northern parts of the Island, as at Rocky Cape, Georgetown, etc.—(Fl. Nov.–Jan.)

Distrib. New South Wales and Victoria.

Gen. V. PROSTANTHERA, *Lab.*

Calyx campanulatus, tubo brevi 13-striato, labiis indivisis, fructiferis clausis. *Corolla* ringens, fauce campanulata, labio superiore erecto subplano, inferiore patente. *Stamina* 4, fertilia; antherarum loculis parallelis, connectivo subtus calcarato, calcare interdum obscuro. *Stylus* breviter bifidus.—Frutices *glandulosi, graveolentes;* foliis *oppositis;* floribus *axillaribus v. in racemos axillares et terminales dispositis:* pedunculis *bibracteatis.*

A large genus of shrubby plants, confined to Australia and Tasmania, whence thirty species have been procured, which, with a solitary exception, are natives of the south-eastern quarter of the continent, between subtropical New South Wales and Adelaide. The genus is replaced in South-western Australia by its allies *Hemiandra* and *Hemigenia*, which number an almost equal amount of species, and of which only two are found in the South-eastern quarter.—*Shrubs*, generally strongly scented, being covered with sessile glands. *Leaves* opposite. *Flowers* axillary, or owing to the smallness of the floral leaves appearing to be spiked. *Calyx* campanulate, short, two-lipped, the lips entire, closed over the fruit. *Corolla* with a short tube and campanulate mouth, two-lipped; upper lip bifid, lower three-lobed, the lobes entire or bifid. *Stamens* all fertile, with parallel anthers and a spurred or thickened connective. *Spurs* often two, bearded at the apex, pointing downwards. *Fruit* subbaccate; seeds with very scanty albumen. (Name from *προσθηκη, a process*, and *ανθηρ.*)

1. **Prostanthera lasianthos** (Lab. Fl. Nov. Holl. ii. 18. t. 157); foliis oblongo-lanceolatis dentato-serratis glabris, racemis paniculatis, corollis utrinque hirsutis, antherarum calcare longiore loculum superante, breviore loculo æquilongo adnato.—*Br. Prodr.* 508; *Andr. Bot. Rep.* 10. *t.* 641; *Bot. Reg.* 143; *Bot. Mag.* 2434; *DC. Prodr.* xii. 559. (*Gunn*, 57.)

Hab. Common by the margins of forests and banks of streams throughout the Colony.—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia; New South Wales and Victoria.

A branching shrub, 5–7 feet high, everywhere glabrous, except the flowers, which have very hairy corollas.—*Leaves* lanceolate, serrate and toothed, 2–4 inches long. *Flowers* in axillary and terminal, leafless, paniculate racemes, large and showy. *Calyx* minutely fringed. *Corolla* about $\frac{1}{3}$ inch in diameter.

2. **Prostanthera rotundifolia** (Br. Prodr. 509); ramulis pubescentibus tomentosisve, foliis (parvis) petiolatis coriaceis rotundatis spathulatis cuneatisve integerrimis crenatisve glabris puberulisve, floribus axillaribus subracemosisve, calyce cinerascente labiis integerrimis, corolla pilosula, antherarum calcaribus æqualibus obscuris loculis adnatis.—*Benth. in DC. Prodr.* xii. 560. (*Gunn*, 58.) (Tab. LXXXIX.)

Hab. Abundant on the North and South Esk Rivers, *Scott, Lawrence, etc.*—(Fl. Nov.)

Distrib. New South Wales and mountains of Victoria.

Mr. Gunn describes this as one of the most beautiful plants in the Colony, and very easily cultivated; it is also very local, he not having found it anywhere but in the localities indicated: it forms a large, strong-smelling bush, 4–7 feet high, loaded with deep lilac or purple flowers.—*Branches* robust, pubescent or tomentose. *Leaves* small, $\frac{1}{3}$ inch long, petioled, spathulate, cuneate or rotundate, coarsely crenate, rarely entire, minutely downy. *Flowers* shortly pedicelled, axillary or arranged in terminal, subsecund, simple racemes. *Calyx*-tube deeply grooved; lips short, rounded. *Corolla* about $\frac{1}{3}$ inch across, pubescent externally. *Anthers* included, the spurs very obscure. —Plate LXXXIX. Fig. 1, branch and leaf; 2, side, and 3, front view of flower; 4, corolla, laid open; 5, front, and 6, back view of stamen; 7, pistil:—*all magnified.*

3. **Prostanthera cuneata** (Benth. in DC. Prodr. xii. 560); ramulis pubescentibus, foliis (parvis) coriaceis obovatis cuneatis obtusis integerrimis v. subcrenatis glabris marginibus recurvis, floribus axillaribus et subracemosis, calycis labiis amplis, corollæ labio superiore brevi lobis truncatis antherarum calcare altero loculum bis superante altero loculo breviore adnato. (*Gunn*, 725.) (Tab. XC.)

Hab. Sterile, gravelly soil on the banks of the South Esk, about nine miles from Launceston; abundant, *Gunn.*—(Fl. Dec.)

A small, powerfully odoriferous shrub, about 2 feet high, with rooting branches and white flowers. *Stems* and branches robust, pubescent. *Leaves* very small and coriaceous, about 2–3 lines long, spreading, obovate or spathulate, blunt, entire or nearly so, glabrous. *Flowers* in subterminal racemes. *Calyx* glabrous, very large, half as long again as the leaves, with large, broad lips, very different from those of *P. rotundifolia*. *Corolla* about as large as that of the last-named species, slightly pubescent.—Plate XC. Fig. 1, branch and leaf; 2, flower; 3, corolla, laid open; 4, front, and 5, back view of stamens; 6, pistil:—*all magnified.*

Gen. VI. WESTRINGIA, *Sm.*

Calyx campanulatus, subæqualiter 5-dentatus v. 5-fidus, costatus. *Corollæ* labium superius alte bilobum, planum. *Stamina* superiora fertilia, antheris dimidiatis, connectivo brevi sub insertione vix producto; inferiora antheris bipartitis cassis.—Frutices *eglandulosi, sæpius tomentosi, sempervirentes;* foliis *integerrimis, verticillatis;* floribus *axillaribus, solitariis paucisve, bibracteatis, albis.*

About twelve species of this genus are known, all of them Australian, and the majority natives of the south-east quarter of the continent. All are slender, with whorled, eglandular, evergreen, coriaceous leaves, often glabrous above and white beneath.—*Flowers* axillary, solitary or few together, bibracteate, generally white. *Calyx* five-toothed, five-angled. *Corolla* with a plane, bifid upper lip, and three-parted lower. *Stamens* distant, the two upper only polliniferous, dimidiate; the lower with bipartite, empty anthers. (Named in honour of *J. P. Westring*, a physician to the King of Sweden.)

1. **Westringia rubiæfolia** (Br. Prodr. 501); ramulis puberulis, foliis quaternis lanceolatis ellipticis planiusculis v. marginibus recurvis glaberrimis nitidis subtus concoloribus pallidioribusve, calycibus glabriusculis, dentibus tubo sublongioribus.—*Benth. in DC. Prodr.* xii. 571. (*Gunn*, 360, 1224.)

Hab. Abundant throughout the Colony, ascending to 3000 feet.—(Fl. Oct.) (*v. v.*)

A small and very beautiful shrub, 1–3 feet high.—*Stem* woody at the base, with many erect branches. *Leaves* closely set, quaternate, glabrous, shining above, not white below, though often pale green, elliptical or lanceolate, acute or blunt, margins revolute, rarely plane, ¼–½ inch long. *Flowers* collected towards the ends of the branches, forming leafy capitula.—It is remarkable that this species has not been found in the Victoria Colony.

2. **Westringia brevifolia** (Benth. in DC. Prodr. xii. 570); fruticulus, ramulis gracilibus puberulis, foliis quaternis anguste lineari-ellipticis linearibusve acutis subtus argenteis marginibus recurvis, floralibus calycem æquantibus, calycis argentei dentibus tubo dimidio brevioribus. (*Gunn*, 213.) (Tab. XCI.)

Hab. About thirty-five miles south of Launceston, *Gunn.*—(Fl. Oct.)

A small shrub, with more slender branches, and smaller, narrower leaves, than *W. rubiæfolia*, from which it may be at once distinguished by the white under-surface of the leaves.—Plate XCI. Fig. 1, branch and whorl of leaves; 2, side, and 3, front view of flowers; 4, corolla, laid open; 5, fertile, and 6, sterile anther; 7, pistil:—*all magnified.*

3. **Westringia angustifolia** (Br. Prodr. 501); ramis robustis puberulis tomentosisve, foliis ternis linearibus acutis subpungentibus marginibus fere ad costam revolutis sicco superne rugulosis subtus cinereis, dentibus calycis tubo dimidio brevioribus.—*Benth. in DC. Prodr.* xii. 571. (*Gunn*, 1223.)

Hab. Southern and central parts of the Colony, as at Marlborough, South Cape, Huon River, and New Norfolk.—(Fl. Nov., Dec.) (*v. v.*)

Distrib. New South Wales? (Cultivated in England.)

This is very distinct from either of the preceding species, but is, I suspect, a large state of the *W. eremicola*, A. Cunn., of New South Wales.—A small shrub, 4–6 feet high, with stout branches and pubescent or tomentose branchlets. *Leaves* close-set, ternate, spreading, about ¾–1 inch long, narrow-linear, acute, almost pungent, smooth above, shining and rugulose, below white, the margins rolled back to the midrib. *Calyx* cinereous or glabrous, with short, acute teeth.

Gen. VII. TEUCRIUM, *L.*

Calyx tubulosus, 5-fidus, subæqualis. *Corollæ* tubus brevis, intus exannulatus; labium superius abbreviatum, bipartitum, laciniis lateraliter reflexis; inferius 3-lobum, lobo medio majore. *Stamina* 4, fertilia, inter lacinias labii superioris exserta; antherarum loculis confluentibus. *Nuculæ* latere interiore baseos oblique affixæ.—Herbæ, *rarius* frutices; *habitu etc. variæ.*

Of this extensive European and Asiatic genus there are only six or seven Australian species, one of which (*T. corymbosum*) likewise inhabits Tasmania.—A slender, erect, pubescent, sparingly-branched herb, 2 feet high. *Leaves* opposite, ovate-elliptical, obovate or lanceolate, shortly petioled, coarsely, irregularly, bluntly serrate, ¾–1½ inch long. *Cymes* axillary, panicled towards the ends of the branches; peduncles erect, slender, bracteolate at the forks. *Flowers* pedicelled, erect. *Calyx* campanulate, 1½ line long, very pubescent; teeth acute, shorter than the tube. *Corolla* 4 lines long, its tube longer than the calyx; limb ringent, two-lipped, upper lip bifid, under three-lobed, middle lobe the largest, linear-oblong, concave. *Stamens* all fertile; filaments very long, exserted from between the lobes of the upper lip. (Named after *Teucer*, King of Troy, said to have used a species medicinally.)

1. **Teucrium corymbosum** (Br. Prodr. 504); herbaceum, pubescens, foliis ovatis ovato-oblongis lanceolatisve grosse irregulariter obtuse serratis, cymis axillaribus pedunculatis versus apices ramorum paniculatis, calyce campanulato pubescente lobis acutis.—*Benth. in DC. Prodr.* xii. 577. (*Gunn*, 70.)

Hab. Not uncommon in dry places in various parts of the Colony: Hobarton, *Gunn.*—(Fl. Nov.)
Distrib. New South Wales and Victoria.

Gen. VIII. AJUGA, *L.*

Calyx ovato- v. globoso-campanulatus, subæqualis, 5-fidus. *Corolla* bilabiata, labio superiore minimo, inferiore elongato patente. *Stamina* exserta, ascendentia, omnia fertilia, inferiora longiora, antheris 2-locularibus reniformibus, loculis confluentibus.—Herbæ *humiles;* foliis *radicalibus petiolatis;* verticillastris *axillaribus v. (foliis floralibus abbreviatis) in spicas v. racemos foliosos terminales dispositis.*

The distribution of this genus is rather peculiar: in the northern hemisphere various species inhabit Europe, Northern and Western Asia, and the Himalayas; one is found in South Africa, and the rest (four or five) in Australia. The majority are lowly herbs, with petiolate, radical leaves, and erect or ascending branches, bearing whorls of nearly sessile flowers in the axils of the floral leaves, and when the latter are small, the inflorescence appears racemose or spiked. The *A. Australis* is, according to Bentham, very closely allied to a European species (*A. Genevensis*); it forms a small, glabrous, pubescent, villous or somewhat silky, leafy herb, 3–10 inches high, with a stout, perennial root, and erect or ascending, stout stems.—*Radical* leaves 1–4 inches long, petiolate, oblong-spathulate, obtuse, entire or crenate; cauline leaves usually silky, linear-oblong, very variable in size, sessile, rarely petiolate; floral leaves similar to the cauline, much longer than the flowers. *Whorls* of flowers distant or crowded, very villous. *Calyx* bell-shaped, five-cleft. *Corolla* bluish, two-lipped; upper lip very short, truncate, lower large. *Stamens* all fertile, with long, exserted, ascending filaments, and reniform anthers, whose cells are divaricating below and confluent above. (Name from **a**, privative, and **ζευγος**, *a yoke;* in allusion to the equal calyx.)

1. **Ajuga Australis** (Br. Prodr. 503); pubescens villosus subsericeus glabratusve, stolonibus nullis, caulibus ascendentibus erectisve, foliis radicalibus anguste oblongis obtusis petiolatis crenatis integerrimisve, caulinis sæpius sinuatis crassiusculis floralibus conformibus flores superantibus.—A. Australis *et* A. Diemenica, *Benth. Lab.* 695 *et in DC. Prodr.* xii. 597. (*Gunn,* 32 *et* 865.)

Hab. Common in damp meadows, etc., throughout the Colony.—(Fl. Nov.) (*v. v.*)

Nat. Ord. LVII. MYOPORINEÆ, *Br.*

This extensive Australian Family abounds in the subtropical and extratropical regions of the Australian continent, both on the east and west coasts and in the interior, but, singularly enough, only one species inhabits Tasmania: it would be a curious problem to investigate the causes of its rarity in Tasmania, of which *Loranthus* affords a parallel case. Very few species are found in other parts of the world, and these are chiefly Polynesian. About fifty Australian species are known, belonging to ten genera; the majority inhabit the south-western quarter of the continent. Of the largest genus, *Myoporum,* the species are extremely variable, and not well defined: many of them appear to me to be common to the south-eastern and south-western quarters, and some of the same to be subtropical also, but without extensive suites of specimens of such variable plants it is impossible to define their limits satisfactorily.

Gen. I. MYOPORUM, *Banks et Sol.*

Calyx 5-partitus, persistens, fructifer haud v. parum auctus. *Corolla* hypocrateriformis v. subcampanulata, tubo brevi, limbo 5-lobo subæquali. *Stamina* 4, didynama. *Ovarium* 2-loculare, loculis 2-ovulatis v. 4-loculare loculis 1-ovulatis, ovulis pendulis; stylo erecto, stigmate obtuso. *Drupa* baccata, 2–4-locularis. *Semina* albuminosa; *embryone* tereti; radicula supera.—Frutices *ramulis foliisque novellis sæpe*

binatis; foliis *plerisque alternis, pellucido-punctatis;* pedunculis *solitariis fasciculatisve;* corolla *fauce barbata.*

About thirty Australian species of *Myoporum* are known; all are erect or suberect shrubs, with alternate leaves, and with the young branches and leaves often covered with a viscid secretion from pellucid glands.—*Flowers* without bracts, axillary, peduncled, solitary or fascicled. *Calyx* five-cleft. *Corolla* salver-shaped or campanulate, rather obliquely five-lobed, bearded at the throat. *Stamens* four, didynamous. *Ovary* two- or four-celled: cells, when two, each two-seeded, when four, each one-seeded. *Style* erect, with a simple stigma. *Drupe* with two- or four-celled nuts, with albuminous, pendulous seeds. (Name from μυω, *to shut*, and πορος, *a pore;* in allusion to the glands of the foliage.)

1. **Myoporum Tasmanicum** (DC. Prodr. 709); erectum, glaberrimum, ramulis non viscidis, foliis petiolatis lanceolatis obovato-lanceolatis ellipticis spathulatisve acuminatis v. acutis v. rotundatis cum apiculo integerrimis v. ultra medium serrulatis, corolla intus tomentosa, drupa 2–3-loculari.

Var. *α*; foliis majoribus 1–1½-pollicaribus obovato-lanceolatis spathulatisve acutis v. apiculatis integerrimis.—M. ellipticum, *Br.? Prodr.* 515.

Var. *β*; foliis majoribus 1–1½-pollicaribus lanceolatis acuminatis ultra medium serratis, ovario 2-loculari.—M. serratum, *Lindl. in Bot. Reg.* 1845. *t.* 15, *an* M. serratum, *Br.? l. c., v.* M. insulare, *Br.? l. c.*

Var. *γ*; foliis minoribus ¾-1-uncialibus lanceolatis acuminatis vix serrulatis, ramis tuberculatis.—M. tuberculatum, *Br.? Prodr. l. c.*

Hab. Var. *α* and *β*. Abundant on the north coasts of the Island, in sand near the sea. Var. *γ*. Flinders' Island.—(Fl. Jan.)

Distrib. Coasts of Australia, from the tropics, on the east coast, to Swan River.

Gunn does not distinguish at all between the vars. *α* and *β*, and probably they were gathered from one tree, nor would I have separated them as varieties but to draw attention to their possible identification with Brown's plants. The var. *γ* Gunn thinks undoubtedly the same species. I find specimens from various parts of the coasts of extratropical Australia agreeing with all these forms, but still none of them perfectly tally with Brown's description; thus var. *α* differs from his *M. ellipticum* in the leaves being sometimes serrate; var. *β* from *M. serratum* in the drupe being only bilocular, and from *M. insulare* in that character, and in the young leaves not being viscid, and from *M. adscendens* in the branches not being diffuse; var. *γ* differs from *M. tuberculatum* in the leaves not being covered with tuberculated glands as the branches are. On the other hand not one of these characters, negative or positive, is of any constancy; the leaves varying extremely in shape and serratures; the viscidity being in all probably very variously developed, according to season, age, etc.; the number of cells of the four-celled drupes is sometimes reduced to three, and sometimes even to one; and the habit of the species is probably still more variable. It is also far too nearly allied to the New Zealand *M. insulare*, Forst.—Gunn describes this as forming a dome-shaped bush, 6–10 feet high, with white flowers, speckled with purple and blue berries.

Nat. Ord. LVIII. SOLANEÆ.

This eminently tropical Order has many (thirty or forty) species in Northern Australia, including some widely distributed Indian and Polynesian plants; there are also a few extratropical species. By far the larger number belong to the genus *Solanum* itself, the only other genera being *Nicotiana*, containing two or three truly indigenous and some naturalized species; *Lycium*, with one species from Victoria; and *Physalis*, of which several South American kinds are naturalized, and especially the common "Cape Gooseberry," *P. Peruviana?*

Gen. I. SOLANUM, *L.*

Calyx 5–4-fidus. *Corolla* rotata, raro campanulata, 5–4-fida, limbo plicato. *Stamina* 5, laciniis co-

rollæ alterna; antheris sæpissime conniventibus, apice poro gemino dehiscentibus. *Bacca* subglobosa, 2- (rarius 4-) locularis. *Semina* albuminosa; embryone curvato.—Herbæ *v.* frutices; foliis *alternis, indivisis, lobatis pinnatisectisve;* inflorescentia *sæpius cymosa, extra-alari.*

About thirty Australian *Solana* have been described, the majority of which are natives of the subtropical eastern parts of the continent, but there are also many extratropical species. The genus has the peduncle of the flowers (which are usually in cymes) often adnate to the branch for a considerable distance above the axil of the leaf to which it belongs.—*Calyx* quinquefid or quadrifid. *Corolla* with four or five plaited lobes. *Stamens* five, with the long anthers generally placed so closely together as to form a cone in the middle of the flower, their cells bursting by terminal pores. *Fruit* a two- to four-celled berry, with numerous albuminous seeds, containing a cylindrical, curved embryo. (Name of doubtful origin.)

1. **Solanum nigrum** (Linn. Sp. Pl. 266); pubescens v. glabratum, caule herbaceo angulato angulis subalatis, foliis gracile petiolatis ovatis ellipticisve sinuato-angulatis acutis membranaceis, cymis lateralibus subumbellatis, floribus parvis, baccis globosis.—*Br. Prodr.* 445; *Fl. N. Zeal.* i. 182. (*Gunn,* 51.)

Hab. Throughout the Island, in waste places (especially near the sea), by roadsides, etc.—(Fl. all summer.) (*v. v.*)

Distrib. Common in most temperate and tropical countries. (A native of England.)

An extremely common and variable plant.—*Stem* herbaceous, angled, the angles sometimes slightly winged. *Branches* slender. *Leaves* membranous, on long petioles, lamina 1–3 inches long, ovate or elliptical, acute, variously angled, sinuate or coarsely toothed. *Cymes* peduncled, few-flowered. *Flowers* white or yellowish, subumbellate, small, about ¼ inch across. *Sepals* blunt. *Corolla* truncate. *Berry* about the size of a pea, whitish, yellow, black, or red, but I have seen only the yellow and black varieties in Australia and Tasmania.

2. **Solanum aviculare** (Forst. Prodr. 107); herbaceum, basi fruticosum, glabrum, foliis membranaceis lineari-lanceolatis v. ovato-lanceolatis subacutis integris v. varie profunde pinnatifidis laciniis linearibus elongatis brevibusve, cymis axillaribus v. extra-alaribus, calyce breviter 5-fido, corollæ lobis acutis obtusis emarginatisve, antheris non conniventibus, baccis subglobosis v. ovoideis.—*Fl. N. Zeal.* i. 182; *Dunal in DC. Prodr.* xiii. 69. S. laciniatum, *Ait. Hort. Kew.* i. 247; *Br. Prodr.* 445; *Bot. Mag.* 349; *Lodd. Bot. Cab.* 717. (*Gunn,* 376.)

Hab. Common in damp, shaded woods, etc.—(Fl. Oct.–Dec.) (*v. v.*)

Distrib. Tropical and temperate Eastern Australia; Timor?; New Zealand. (Introduced into England.)

A very handsome plant, which Gunn states is tender, and annually killed by the frost at Launceston: this however is not the case at Hobarton, where it is very common. It is also a very variable plant, and Gunn suspects that the Tasmanian species may not be the same as a Port Phillip one, though he adds that they are undistinguishable in a dry state. It is only natural to suppose that so considerable a difference of latitude and other features as the opposite sides of Bass' Straits present, should be accompanied with a recognizable difference in the habit of a succulent, herbaceous plant, belonging to so variable a genus as *Solanum*. On the other hand, Mueller distinguishes two Victoria species,—one, the common *S. laciniatum*, and the other, his *S. vescum* (the *Gunyang* of the aborigines), which is probably the typical *S. aviculare* of Forster, which I have considered not specifically distinct from *S. laciniatum*, and which is eaten abundantly in New Zealand by man. Whether, then, there are two species or one, or, what is most probable, several well-marked varieties of one, must be left to the local botanist to determine; what characters there may be must be very insignificant, to be destroyed in the operation of a careful drying. The length and breadth of the lobes of the corolla seem to be particularly liable to vary.—A stout, succulent, glabrous, branched herb, 1–3 feet high, with woody base to the stem. *Leaves* 2–8 inches long, narrow-lanceolate and quite entire, or laciniate with many long or short lateral lobes, and then more or less pinnatifid. *Cymes* two- or more-flowered, axillary or lateral. *Flowers* large, ½–1½ inch across, generally of a dingy blue. *Berry* as large as a marble, spherical or ovoid, yellow or green or purplish. *Anthers* not forming a cone.

Nat. Ord. LIX. SCROPHULARINEÆ.

One of the most extensive Orders of Dicotyledonous plants, abounding in most temperate and tropical countries, but remarkably sparingly represented in Australia, where only about eighty species have been detected. Of these a considerable number are tropical weeds, and belong to genera found commonly in India; such are species of *Herpestes*, *Gratiola*, and *Vandellia*: one large genus is wholly Australian, namely *Anthocercis*; of *Mimulus*, which is principally an American genus, there are five or six species, whilst of *Veronica* and *Euphrasia* there are a considerable number. Nearly one-third of the Australian species are tropical, about a dozen are natives of South-western Australia, and the remainder inhabit the south-eastern quarter, including Tasmania; very few are common to the south-eastern and south-western quarters.

Gen. I. ANTHOCERCIS, *Lab.*

Calyx 5-fidus. *Corolla* campanulata, fauce ampla, limbo subæquali, lobis acutis æstivatione leviter induplicatis. *Stamina* 4, didynama, inclusa, antherarum loculis dorso appositis apice subconfluentibus. *Stylus* apice dilatato-bilobus, lobis intus stigmatosis. *Capsula* oblonga v. subglobosa, valvis chartaceis v. subcoriaceis, integris bifidisve, septo tenui. *Embryo* rectus v. leviter curvatus.—Frutices *glabri v. stellato-pubescentes;* foliis *alternis integris v. angulato-dentatis;* pedunculis *falso-axillaribus* 1–3-*floris;* corollis ***albis v. ochroleucis, intus sæpissime purpureo-lineatis.*** (***Benth. in DC. Prodr.***)

An Australian genus, with about fifteen species, some of which have been removed by Mr. Miers to another genus, *Cyphanthera*, founded on the one-celled anther and four-valved capsule, but which appears to Bentham and myself to be only a section of *Anthocercis*. The species are all natives of extratropical Australia, and chiefly of the south coast; some however are confined to New South Wales, and others to the Swan River colony. All are shrubs, with alternate leaves, glabrous or covered with stellate pubescence. The peduncles are subaxillary, one- to three-flowered, and the flowers are in some species large and showy. The corolla has a slightly induplicate æstivation, whence the genus has been placed in *Solaneæ*, from which the stamens distinguish it. The Tasmanian species (which belongs to the section *Cyphanthera*) is a slender shrub, 8–10 feet high, covered with stellate pubescence. Mr. Gunn draws my attention to its being alluded to in Backhouse's notes as being probably a bi-perennial, that is, flowering in perfection during the second year, and declining gradually for the following two or three years.—*Branches* terete. *Leaves* about an inch long, lanceolate, obtuse, entire, minutely scaberulous above, tomentose beneath, veins prominent, margins strongly recurved. *Peduncles* erect, one- or two-flowered, bracteolate. *Calyx* five-lobed, lobes narrow. *Corolla* erect, pale yellow, streaked with purple, campanulate, with a long tube, twice as long as the calyx, pubescent externally, lobes linear-oblong. *Stamens* four, didynamous, included. *Anther* unilocular. *Capsule* globose, four-valved, four-seeded. (Name from ανθος, *a flower*, and κερκις, *a ray;* in allusion to the spreading lobes of the corolla.)

1. **Anthocercis Tasmanica** (Hook. fil.); dense stellatim tomentosa, ramis teretibus, foliis lineari-oblongis ellipticisve subobtusis marginibus recurvis supra scaberulis subtus albo-tomentosis venis prominentibus, pedunculis gracilibus calycibusque cano-pubescentibus, corollæ lobis lineari-oblongis.—Cyphanthera Tasmanica, *Miers in Ann. Nat. Hist.* xi. 377. (*Gunn*, 1992.) (Tab. LXXXVIII. *A.*)

Hab. Kelvedon, Great Swan Port, amongst Gum-trees, *Backhouse;* Cygnet River, *Stuart.*—(Fl. Nov.)

Plate LXXXVIII. *A.* Fig. 1, flower; 2, same, with the corolla expanded; 3, the same, with the corolla laid open; 4, upper, and 5, lower stamens; 6, anther; 7, pistil; 8, stellate hairs:—*all magnified.*

Gen. II. MIMULUS, *L.*

Calyx tubulosus, 5-dentatus, 5-gonus. *Corollæ* labium superius erectum v. reflexum, 2-lobum, infe-

rius patens, 3-lobum; fauce sæpius bigibbosa, laciniis rotundatis planis. *Stamina* fertilia 4, antherarum loculis demum confluentibus. *Stigma* subæqualiter 2-lamellatum. *Capsula* 2-valvis, loculicide dehiscens; valvis integris raro bifidis, medio septiferis, columnam centralem placentiferam nudantibus.—Herbæ *plerumque humiles, decumbentes v. ascendentes;* foliis *oppositis;* pedunculis *axillaribus, solitariis,* 1-*floris, superioribus interdum versus apices ramorum subracemosis.*

The majority of the species of *Mimulus* are *American*, but there are a few Indian, and about six Australian. The latter are all small, creeping or suberect herbs, with four-angled stems, opposite leaves, and axillary, solitary flowers.—*Calyx* tubular, five-angled and five-toothed. *Corolla* two-lipped; upper erect or reflexed; lower three-lobed. *Stamens* four, all fertile. *Style* terminated by two nearly equal, stigmatiferous plates. *Capsule* two-valved; valves entire or bifid, separating from a central, placentiferous column. (Name, *mimulus*, a little mask; in allusion to the appearance of the flowers.)

1. **Mimulus repens** (Br. Prodr. 439); pusillus, repens, glaberrimus, foliis amplexicaulibus sessilibusve ovatis oblongisve obtusis integerrimis crassiusculis subenerviis, pedunculis folio brevioribus longioribusve, calycibus ovatis truncatis brevissime dentatis.—*Benth. in DC. Prodr.* x. 373; *Fl. N. Zeal.* i. 188. (*Gunn,* 77.)

Hab. Common in saline situations, muddy banks of rivers, etc.—(Fl. Dec.)

Distrib. New South Wales and Victoria; New Zealand.

A small, perfectly glabrous, creeping, succulent herb.—*Stems* 2–4 inches long, sending spreading branches over marshy ground. *Leaves* 2–6 lines long, orbicular or oblong, sessile, quite entire. *Peduncle* of variable length. *Calyx* truncate. *Corolla* large, beautiful bright blue, sometimes ½ inch across the lobes.

Gen. III. MAZUS, *Lour.*

Calyx late campanulatus, 5-fidus. *Corollæ* labium superius erectum, ovatum, breviter bifidum, inferius multo majus patens, trifidum; fauce bigibbosa. *Stamina* fertilia 4; antherarum loculis contiguis, divaricatis. *Stigma* subæqualiter bilamellatum, laciniis ovatis. *Capsula* globosa v. compressa, obtusa, loculicide bivalvis, valvis integris. *Placentæ* crassæ, subcarnosæ.—Herbæ *sæpius surculosæ;* foliis *inferioribus oppositis, ramorum floralium vulgo alternis;* racemis *terminalibus, aphyllis, subsecundis;* pedicellis *alternis, unifloris.* (*Benth. in DC. Prodr.*)

A small genus, containing but one Australian species, whose congeners inhabit the mountains of India, the Malay Peninsula and Islands, and New Zealand.* The *M. Pumilio* forms a small glabrous or pilose herb, 2–6 inches high, very variable in size of leaf and flower, and length of peduncle.—*Stems* very short, rising from a long, underground, creeping rhizome. *Leaves* radical, ½–4 inches long, linear, obovate-oblong or spathulate, blunt, entire or sinuate and toothed. *Scapes* shorter or longer than the leaves, sometimes 5 inches long, one- to five-flowered, racemose or paniculately branched; pedicels slender, ¼–1½ inch long, erect, patent or recurved, each with a subulate bract beneath the flower. *Calyx* campanulate, five-toothed, much shorter than the corolla. *Corolla* ¼–⅔ inch long, pale blue; upper lip curved back, a little bifid; lower very large, three-lobed; mouth with two swellings. *Stamens* four; anther-lobes spreading. *Style* with two flat plates at the top. *Capsule* globose, compressed, blunt, loculicidal. (Name from *μαζος, a breast;* from the swellings on the throat of the corolla.)

1. **Mazus Pumilio** (Br. Prodr. 439); glaberrimus v. pilosiusculus, caule brevissimo, foliis radicalibus lineari-oblongis obovatis subspathulatisve obtusis integerrimis sinuato-dentatisve, scapis 1–5-floris,

* Better specimens of *Mimulus? radicans*, than I had when drawing up the 'Flora of New Zealand' (i. 188), prove this plant to be a *Mazus*.

pedicellis elongatis, corolla calyce subtriplo longiore.—*Benth. in DC. Prodr.* x. 375; *Endl. Iconograph. t.* 102; *Hook. Ic. Pl. t.* 567; *Fl. N. Zeal.* i. 189. (*Gunn*, 528.)

Hab. Common in wet places.—(Fl. Nov.) (*v. v.*)

Distrib. New South Wales and Victoria; New Zealand.

Gen. IV. GRATIOLA, *L.*

Calyx 5-partitus, segmentis angustis. *Corollæ* labium superius integrum v. breviter bifidum; inferius trifidum, palato non prominente. *Stamina* 2 postica fertilia, inclusa; antherarum loculis parallelis; 2 antica sterilia, filiformia v. nulla. *Stylus* apice deflexus, dilatatus v. 2-lamellatus. *Capsula* 4-valvis, carpellorum marginibus inflexis, columnam placentiferam nudantibus.—Herbæ *parvæ;* foliis *oppositis, integerrimis v. dentatis;* pedunculis *unifloris, axillaribus;* calyce *sæpissime 2-bracteato.*

Principally an American genus, of which there are a few Asiatic and about four Australian species; all are herbs, with generally prostrate, creeping stems, having the habit and most of the essential characters of *Mimulus*, but the calyx is short and quinquepartite; only two of the stamens are fertile, and the capsule is four-valved. (Name from *gratia*, grace; in allusion to the medicinal properties of *G. officinalis*.)

1. **Gratiola pubescens** (Br. Prodr. 435); procumbens, viscido-puberula, foliis oblongo-lanceolatis acutiusculis dentatis trinervibus amplexicaulibus, floribus subsessilibus, filamentis sterilibus elongatis.—*Benth. in DC. Prodr.* x. 405; *Fl. N. Zeal.* i. 189.

Hab. Tasmania, *Brown.*

Distrib. New South Wales and Victoria; New Zealand.

I have seen no Tasmanian specimens of this plant (if it be not the *G. nana* described below), which, from Bentham's remarks, seems to be extremely nearly allied to *L. Peruviana*. I have described New Zealand ones in the Flora of that country. They form small, creeping, minutely pubescent plants, 2–4 inches long, with slender stems and branches, and sessile, oblong-obovate or oblong-lanceolate, obscurely toothed leaves, 2–3 lines long. *Peduncles* about half as long as the leaves, slender. *Calyx* campanulate. *Sterile filaments* elongated.

2. **Gratiola latifolia** (Br. Prodr. 435); procumbens, glabra, foliis ovatis oblongisve obtusis obsolete crenatis integerrimisve 3–5-nervibus semiamplexicaulibus, floribus sessilibus, corollæ labio superiore breviter bifido, filamentis sterilibus brevibus.—*Benth. in DC. Prodr.* x. 404. G. glabra, *Walp. Rep.* iii. 287. (*Gunn*, 264.)

Hab. Common in wet, gravelly, etc. places, everywhere.—(Fl. Dec.–Feb.)

Distrib. New South Wales and Victoria.

Glabrous. *Stems* stout, prostrate, with ascending tips and branches, 6–10 inches long. *Leaves* ½–1 inch long, sessile, semiamplexicaul, oblong or ovate, obtuse, obscurely crenate, or quite entire. *Peduncles* very short. *Flowers* about ⅓ inch long, yellow. *Corolla*, with its tube, twice as long as the calyx. *Sterile filaments* short.

3. **Gratiola nana** (Benth. in DC. Prodr. x. 404); pusilla, procumbens, cæspitosa, glabra v. puberula, foliis cuneato-oblongis subdentatis basi angustatis, floribus subsessilibus, filamentis sterilibus elongatis. *An* G. pubescens, *Br.?* (*Gunn*, 724.)

Hab. Sandy and marshy banks of rivers, etc., in alpine situations; Marlborough, Hampshire Hills, and Arthur's Lakes, *Milligan, Gunn.*—(Fl. Jan.)

Cæspitose, forming matted tufts, perfectly glabrous or puberulous. *Stems* 1–4 inches long, much branched. *Leaves* 2–4 lines long, cuneate or linear-oblong, blunt, obscurely toothed or quite entire. *Peduncles* very short, stout. *Calyx* deeply divided, lobes linear. *Corolla* ⅕–⅓ inch long, pale pink and white.—I suspect this is Brown's *G. pubescens.*

Gen. V. GLOSSOSTIGMA, *Arn.*

Calyx campanulatus, obtuse 3–4-lobus. *Corolla* minima; labio superiore bilobo, inferiore paulo majore, 3-lobo. *Stamina* 2–4; antheris unilocularibus. *Stylus* apice spathulatus. *Capsula* subglobosa, loculicide 2-valvis; valvis medio septiferis, columnam placentiferam integram nudantibus.—Herbæ *perpusillæ, repentes, muscoideæ;* foliis *oppositis, spathulatis, integerrimis;* pedunculis *axillaribus, solitariis,* 1-*floris;* floribus *minimis, erectis.*

Very minute, tufted, creeping, moss-like herbs, natives of tropical India and Asia, also of Australia, the Cape of Good Hope, and New Zealand. *G. elatinoides* has stems 1–2 inches long, smooth or slightly hairy. *Leaves* opposite, petiolate, spathulate, quite entire, blunt, 2–4 lines long. *Peduncles* axillary, solitary, one-flowered, erect, shorter or longer than the leaves. *Flowers* very small, erect, 1½ line long. *Calyx* bell-shaped, with five short, blunt lobes. *Corolla* purple, campanulate, two-lipped, rather compressed vertically; lips spreading; upper two-, lower three-lobed; lobes rounded, blunt. *Stamens* four. *Anthers* peltate, exserted; cells didymous, confluent. *Ovary* ovate, with a slender style, and spathulate, flat, fimbriated stigma. (Name from γλωσσα, *a tongue*, and *stigma*.)

1. **Glossostigma elatinoides** (Benth. in Fl. N. Zeal. i. 188); minima, glabra, ad nodos radicans, foliis petiolatis spathulatis lineari-spathulatisve obtusis integerrimis, staminibus 4.—G. Drummondii *et* Tricholoma elatinoides, *Benth. in DC. Prodr.* x. 426. (*Gunn*, 2005.)

Hab. Banks of the South Esk, near Launceston, where it is submerged during a part of the year, *Gunn.*—(Fl. all summer.)

Distrib. South-eastern and South-western Australia; New Zealand.

Gen. VI. LIMOSELLA, *L.*

Calyx campanulatus, 5-dentatus. *Corollæ* tubus brevis, subrotato-campanulatus; limbo subregulari, 5-fido. *Stamina* 4, antherarum loculis confluentibus. *Stylus* brevis; stigmate incrassato, breviter bifido. *Capsula* 2-(raro 3-) valvis; valvis integris, septo tenuissimo incompleto placentifero libero parallelis.—Herbæ *pusillæ, aquaticæ v. uliginosæ, cæspitosæ v. reptantes, glaberrimæ;* caulibus *prostratis, ad nodos radicantibus;* ramis *floriferis brevissimis, foliis pedunculisque dense fasciculatis;* foliis *petiolatis, alternis (oppositisque?), elongatis, integerrimis;* pedunculis *unifloris, solitariis, ebracteatis;* floribus *pusillis.*

A genus of very small, delicate, flaccid plants, growing in marshes, sometimes under water, generally in temperate climates. The only Tasmanian species is also found in Europe, New Zealand, Australia, the Falkland Islands, Kerguelen's Land, throughout North and South America, and is a native of England; it is thus characterized:—Everywhere quite smooth. *Stems* none or creeping, throwing out white fibrous roots and fascicles of leaves. *Leaves* ½–1½ inch long, linear or subulate, blunt or dilated above the middle. *Peduncles* solitary, or several from the roots, short. *Flowers* very minute, white. *Calyx* bell-shaped, five-toothed. *Corolla* obscurely two-lipped, between rotate and bell-shaped; limb five-toothed or -lobed. *Stamens* four; anther-cells confluent. *Style* short; stigma thickened. *Capsule* rounded, often on a curved pedicel, two-valved, partially two-celled; valves entire, parallel to the dissepiment. (Name from *limus*, a marsh; in allusion to the place of growth.)

1. **Limosella aquatica** (Linn. Sp. Pl. 881), var. *tenuifolia;* foliis linearibus lineari-subulatisve obtusis dilatatisve, corollæ lobis ovali-oblongis tubo calycis multoties longioribus.—*Fl. Ant.* ii. 334; *Fl. N. Zeal.* i. 190. L. tenuifolia, *Nutt. Gen. Pl. N. Am.* ii. 43; *Benth. in DC. Prodr.* x. 427. L. Australis, *Br. Prodr.* 443. (*Gunn*, 1996.)

Hab. Probably common in marshy situations, though frequently overlooked; Penquite and Formosa, *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. Extratropical Australia; New Zealand; temperate North and South America; Kerguelen's Land; South Africa. (Often scarcely to be distinguished from the European form.)

Gen. VII. VERONICA, *L.*

Calyx 3–5-partitus. *Corolla* rotata v. breviter campanulata, 4-loba; laciniis patentibus, lateralibus sæpe angustioribus. *Stamina* 2, ad latera laciniæ superioris inserta. *Stylus* elongatus; stigmate subcapitato. *Capsula* compressa, bisulcata; carpellis dorso loculicide dehiscentibus, marginibus inflexis columnæ placentiferæ adhærentibus v. ab ea septicide solutis; v. capsula septicida cum columna placentifera bipartibilis. (*Benth. in DC. Prodr.*)—Herbæ, frutices, *v. rarius* arbores; foliis *oppositis, rarius sparsis verticillatisve, floralibus alternis bracteæformibus;* floribus *sæpius speciosis, racemosis;* racemis *sæpe corymbiformibus, axillaribus terminalibusve.*

This, which is one of the largest and most conspicuous genera of New Zealand, is comparatively scarce in Australia and Tasmania, where however upwards of eighteen species have been discovered, all of them extratropical, and the majority natives of the south-east quarter of the continent and Tasmania, and none of them are found in any other part of the world.—Small trees, shrubs, or creeping herbs, with opposite, exstipulate leaves, and racemose, often blue flowers. *Calyx* generally quadripartite. *Corolla* rotate or campanulate, with a very short tube, deeply four-lobed; lateral lobes generally smaller than the others, sometimes with the lower lobe smallest. *Stamens* two; *filaments* slender; *anthers* two-celled. *Style* slender, with a small, capitate stigma. (Name from *ἱερα εικων, the sacred picture;* because the flowers of a European species were said to bear a representation of our Saviour.)

§ 1. *Capsule turgid; dehiscence septicidal. Valves often bifid, separating from a placentiferous column.*

1. **Veronica formosa** (Br. Prodr. 434); fruticosa, ramis bifariam pilosulis, foliis ($\frac{1}{4}$–$\frac{3}{4}$ unc. longis) confertis brevissime petiolatis oblongo-lanceolatis ellipticisve acutis acuminatisve integerrimis 1-nerviis glabris, racemis in apicibus ramulorum paucifloris laxe subcorymbosis, sepalis anguste lanceolatis acutisve ciliatis glabratisve, capsula calyce duplo longiore valvis a columna centrali vix secedentibus.—*Benth. in DC. Prodr.* x. 462. (*Gunn,* 527.)

Hab. Common on rocky hills in various parts of the Colony, ascending to 3500 feet.—(Fl. Oct.–Dec.) (*v. v.*)

A remarkably beautiful evergreen shrub, covered at the flowering season with lovely lilac flowers.—*Stems* fastigiately branched, 2 feet high; branches with two lines of pubescence. *Leaves* close-set, often recurved or reflexed, small, $\frac{1}{3}$–$\frac{2}{3}$ inch long, lanceolate, oblong-lanceolate or elliptical, quite entire and smooth, acute or acuminate. *Flowers* in subterminal racemes, $\frac{3}{4}$ inch across. *Sepals* often fringed with glandular hairs.

2. **Veronica labiata** (Br. Prodr. 434); erecta, glaberrima v. minute pubernla, foliis subsessilibus lanceolatis v. ovato-lanceolatis longe acuminatis caudatisve argute serratis sub-3–5-nerviis, racemis in axillis superioribus elongatis multifloris, sepalis lanceolato-subulatis corollæ tubum superantibus, capsula ovata obtusiuscula valvis a columna centrali secedentibus.—*Bot. Mag. t.* 3461; *Benth. in DC. Prodr.* x. 463. V. Derwentii, *Andr. Bot. Rep. t.* 531. (*Gunn,* 2.)

Hab. Abundant in many places, especially on the northern and central parts of the Island.—(Fl. Dec.) (*v. v.*)

Distrib. New South Wales, Victoria, and islands of Bass' Straits. (Cultivated in England.)

This again is a very beautiful, half-shrubby, erect species, about 3 feet high, sparingly branched, almost glabrous.—*Stems* and *branches* robust. *Leaves* 2–5 inches long, subsessile, ovate-lanceolate, acuminate, or with long caudate apices, sharply serrated. *Racemes* very abundantly produced, solitary in the axils of the upper leaves.

opposite, a span and more long, very many-flowered. *Flowers* about $\frac{1}{3}$ inch in diameter. Segments of the corolla acute.

§ 2. *Capsule laterally much compressed. Valves firmly adhering to the central placentiferous column.*

3. **Veronica nivea** (Lindl. Bot. Reg. Misc. 1842. p. 42); perennis?, erecta, robusta, ramosa, ramis strictis erectis glaberrimis v. bifariam puberulis, foliis pinnatisectis segmentis anguste linearibus, racemis erectis multifloris terminalibus, bracteis parvis linearibus, sepalis lineari-oblongis, corollæ tubo brevi, capsula emarginata biloba calyce plus duplo longiore lateraliter compressa, valvis columnæ placentiferæ arcte adhærentibus.—*Benth. in DC. Prodr.* x. 471. (*Gunn*, 269.)

Hab. Alpine situations, rather local: Hampshire Hills, Lake Arthur, *Lawrence* (in one spot only); Mount Wellington, *Gunn*.—(Fl. Feb., March.)

Distrib. Victoria, Mount Latrobe, *Mueller*.

A very remarkable and beautiful species, at once recognized by its pinnatisect leaves.—*Stems* numerous from the root, 12–24 inches high, sparingly branched, robust. *Leaves* 1 inch long. *Racemes* terminal, often long and many-flowered. *Calyx* small, its segments very unequal. *Corolla* pure white or lilac.

4. **Veronica calycina** (Br. Prodr. 435); herbacea, caule prostrato basi reptante dein ramisque ascendentibus pilis longis hirsuto, foliis petiolatis late ovatis basi truncatis cordatisve inæqualiter dentatis hirsutis, pedunculis axillaribus brevibus 1–4-floris, pedicellis elongatis, calycis segmentis late oblongis obovatisve ciliatis capsulam obcordato-orbiculatam superantibus.

Var. *a*; foliis basi truncatis, sepalis oblongis.—V. calycina, *Benth. in DC. Prodr.* x. 477. (*Gunn*, 526.)

Var. *β. Gunnii*; foliis basi cordatis, sepalis obovatis.—V. Gunnii, *Benth. l. c.* (*Gunn*, 723.)

Var. *γ. parviflora* (Benth. l. c.); floribus minoribus. (*Gunn*, 1218.)

Hab. Var. *a* and *β*. Very common in rich soil throughout the Colony. Var. *γ*. In dense forests at Circular Head.—(Fl. all Summer.) (*v. v.*)

Distrib. South-eastern Australia.

A slender species, 1–1½ foot long, with very pilose, graceful, creeping stem and ascending branches.—*Leaves* petiolate, about ¼–1 inch long, broadly ovate or ovate-cordate, coarsely crenate or toothed, very variable in breadth, sometimes cuneate at the insertion of the petiole. *Peduncles* solitary, axillary, slender, longer than the leaves, two- to five-flowered; pedicels slender. *Flowers* variable in size. *Bracts* two to three lines long. *Sepals* broadly oblong or obovate.

5. **Veronica distans** (Br. Prodr. 435); herbacea, humilis, caule gracili breviusculo basi repente, ramis ascendentibus erectisve bifariam pubescentibus, foliis (½-uncialibus) breviter petiolatis ovatis grosse crenato-serratis basi cuneatis glabris v. parce hirsutis, racemis axillaribus paucifloris, floribus subcorymbosis, sepalis ovali-oblongis obtusis capsula leviter emarginata longioribus.—*Benth. in DC. Prodr.* x. 479. (*Gunn*, 862.)

Hab. Common on the sand-hills at Circular Head, also found at Recherche Bay, *Labillardière, Gunn*.—(Fl. Nov.)

Distrib. South-eastern and South-western Australia, from Port Phillip to the Swan River.

A small species, with creeping, short stems, and erect, slender branches, about 6–8 inches high.—*Stems* bifariously pilose or pubescent. *Leaves* ½ inch long, petiolate, ovate, subacute, very coarsely serrate, glabrous or pilose, especially on the petiole. *Peduncles* axillary, erect, stout, 1 inch long. *Flowers* corymbose, rarely racemose, few, large; pedicels bracteate at the base, pubescent. *Sepals* obovate-oblong. *Corolla* large, pale pink or blue.—The smaller size, narrower leaves, and shorter petioles, distinguish this from *V. calycina*.

6. **Veronica arguta** (Br. Prodr. 435); caule elongato basi repente procumbente ramisque ascendentibus bifariam pilosis, foliis (1–1½-pollicaribus) longiuscule petiolatis ovato-lanceolatis inciso-serratis glabris pilosisve, racemis axillaribus elongatis laxis pauci- v. multi-floris, pedicellis patentibus, bracteis linearibus obovatis, sepalis ovali-oblongis capsulam latam leviter emarginatam superantibus, capsula lateraliter compressa, valvis columnæ placentiferæ adhærentibus.—*Benth. in DC. Prodr.* x. 476. V. Brownii, *Rœm. et Schultes, Syst.* i. 118? (*Gunn*, 174.)

Hab. Subalpine situations, in forests, etc.; Hampshire Hills and St. Patrick's River, *Gunn.*—(Fl. Feb., March.)

Distrib. New South Wales, *Cunningham;* Victoria, *Mueller.*

A very variable plant, usually about the size of the ordinary state of *V. calycina*, but sometimes very much larger, and Gunn's St. Patrick's River specimens are 2 feet long.—A lax, branching, more or less pilose, slender, decumbent species, with the stems creeping at the base. *Leaves* 1–3 inches long, rather long-petioled, ovate-lanceolate, coarsely serrate. *Racemes* in the larger specimens a foot long, very slender and many-flowered: in the smaller specimens much reduced and corymbose, then quite like those of *V. calycina*, as are the bracts, pedicels, calyx, corolla, and fruit.

7. **Veronica gracilis** (Br. Prodr. 435); humilis, glaberrima, ramis erectis, foliis subsessilibus lanceolatis lineari-lanceolatisve acutis acuminatisve integerrimis v. serratis basi angustatis, racemis axillaribus pedunculatis corymbosis paucifloris, sepalis lanceolatis acutis, capsula late obcordata lateraliter compressa, valvis septo placentifero adhærentibus.—*Benth. in DC. Prodr.* x. 479. (*Gunn*, 65.)

Hab. Moist places, common in many parts of the Colony.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to South Australia.

A very variable plant, best distinguished by its creeping stems, tufted, glabrous habit, erect, slender branches, 3–6 inches tall, narrow, ovate-lanceolate or linear-lanceolate, entire or few-toothed, acuminate leaves, and the small racemes or corymbs of large, lilac or pale blue flowers, with lanceolate, acuminate calyx-lobes.—Gunn sends a very small alpine state, not an inch high, with one-flowered peduncles, from St. Patrick's River.

Gen. VIII. OURISIA, *Comm.*

Calyx 5-lobus v. -partitus. *Corolla* infundibuliformis, incurva v. obliqua; limbi 5-fidi laciniis obtusis planis. *Stamina* 4, didynama, inclusa; antheræ subreniformes, loculis divaricatis confluentibus. *Stylus* apice capitato-stigmatosus. *Capsula* loculicide bivalvis; valvis medio septiferis, placentas auferentibus. *Semina* plurima; testa laxa, reticulata. (*Benth. in DC. Prodr.*)—Herbæ; foliis *oppositis, omnibus conformibus v. radicalibus petiolatis, caulinis nullis v. bracteæformibus oppositis verticillatisve;* floribus *axillaribus, solitariis, verticillatis v. ad apicem pedunculi scapiformis solitariis, racemosis v. subumbellatis.*

Erect or creeping herbs, natives of the mountains of New Zealand, where several species are found, and of South America; only one species is Tasmanian, and it has not hitherto been found in Australia.—*Leaves* opposite, radical or cauline, or both, the latter sometimes whorled. *Flowers* axillary and solitary, or racemose, or subumbellate. *Calyx* five-lobed or -parted. *Corolla* funnel-shaped, with an oblique or incurved tube, and five blunt lobes. *Stamens* four, didynamous. *Anthers* reniform, two-celled; cells divaricating, confluent at top. *Style* capitate. *Capsule* two-valved, loculicidal.—The Tasmanian *O. integrifolia* is a small, glabrous herb, with a short, creeping rhizome, coriaceous, spathulate, petiolate radical leaves, less than 1 inch long, and a bracteate scape, bearing one (rarely branching, and then two-flowered) large, blue-purple flower. (Named in honour of *M. Ouris*, Governor of the Falkland Islands, who procured the first described species from Fuegia.)

1. **Ourisia integrifolia** (Br. Prodr. 439); humilis, subcæspitosa, glaberrima, rhizomate repente,

foliis ($\frac{3}{4}$–1-pollicaribus) radicalibus petiolatis ovato- v. obovato- v. elliptico-spathulatis coriaceis integris grosse crenatisve, scapo 1–2-floro, bracteis paucis oppositis sessilibus oblongis subcrenatis, calycis segmentis oblongis corollæ tubum æquantibus, corollæ limbo valde obliquo laciniis inferioribus tubo æquilongis.—*Benth. in DC. Prodr.* x. 493. (*Gunn*, 277.)

Hab. Not uncommon by alpine rivulets, in shaded places, as on Mount Wellington, the Western Mountains, etc.—(Fl. Dec., Jan.)

Gen. IX. EUPHRASIA, *L.*

Calyx tubulosus v. campanulatus, 4-fidus. *Corollæ* galea late concava, apice 2-loba, lobis latis patentibus; labium patens, trifidum, lobis obtusis emarginatisve, palato non plicato. *Stamina* didynama; antherarum loculis mucronatis. *Stylus* apice subdilatatus. *Capsula* oblonga, compressa.—Herbæ *erectæ, sæpissime basi ramosæ;* foliis *oppositis, lobatis laciniatisve;* floribus *in axillis foliorum superiorum subracemosis, spicatis, capitatisve.*

I have adopted Bentham's characters for the Tasmanian species, which he has unravelled with great skill; the multitude of specimens of varieties and forms sent by Gunn especially, rendered this a very laborious task, whilst on the other hand it is from very copious materials alone that any conclusions can be arrived at.—*Herbaceous* plants, sometimes erect, branched and shrubby at the base, generally glabrous. *Leaves* opposite, lobed, toothed, or cut. *Flowers* solitary, axillary, spiked or subracemose, very variable in size in all the species. *Calyx* tubular or campanulate, quadrifid. *Corolla* with an arched, two-lobed upper lip, and three-lobed, spreading lower one. *Stamens* didynamous, under the arched upper lip. *Anthers* two-lobed; lobes in the Tasmanian species with a sharp, descending spur, more or less hairy, especially towards the line of dehiscence. *Stigma* dilated.—Natives of the temperate and cold regions of both hemispheres, but the species are nowhere numerous; more so in Australia, Tasmania, and New Zealand, than elsewhere; always very variable. The European species are found to be parasitical on the roots of grasses and other herbaceous plants, but no observations have been made on the habits of the southern ones. There are very few (about three or four) Australian *Euphrasiæ* that are not also Tasmanian, and only one of these is an alpine species, viz. Mueller's *E. alsa*, from the alps of Victoria. (Name from *ευφρασια, joy;* in allusion to its reputed virtues.)

1. **Euphrasia alpina** (Br. Prodr. 436); cæspitosa, perennis, glabra v. caule bifariam calycibusque puberulis, caulibus sterilibus brevibus dense foliosis, floralibus pedalibus erectis, foliis dissitis (2 lin. longis) obovato v. oblongo-cuneatis crassiusculis obtusis plerisque apice tricrenatis, spica compacta v. demum interrupta, calycis lobis brevibus obtusissimis v. acutiusculis, corollæ lobis striatis emarginatis (6–8 lin. longis) fauce amplissima.—*Benth. in DC. Prodr.* x. 553. (*Gunn*, 267.)

Var. β. *humilis* (Benth. l. c.); ramis 3–4-pollicaribus, flore vix 5 lin. longo. (*Gunn*, 1221.)

Var. γ. *angustifolia* (Benth. l. c.); floribus plerisque dissitis. (*Gunn*, 1219.)

Hab. Abundant in alpine and subalpine situations. Var. β. On the mountains, elev. 3–4000 feet. Var. γ. Sides of Mount Wellington, etc.—(Fl. Nov.–Jan.) (*v. v.*)

Distrib. Loftiest alps of Victoria, *Mueller.*

A common and very variable species; glabrous, more or less tufted, in its alpine state growing in small patches, 3–4 inches high, with short, conical racemes; in lower grounds taller, with the flowers still crowded; whilst in the var. *angustifolia*, which grows near Hobarton, the stems are 12–14 inches long, leaves narrow, and spikes long, with distant flowers, thus passing into *E. collina.—Stems* and calyces glabrous or puberulous. *Leaves* obovate-oblong, 2–3 lines long, thick, blunt, two- to five-toothed towards the apex, erect, patent, or recurved.

2. **Euphrasia collina** (Br. Prodr. 436); annua?, glabra v. ramis elongatis gracillimis undique pu-

berulis, foliis anguste cuneatis sublinearibusve plerisque apice 3–5-dentatis sublobatisve obtusis, spica elongata, floribus dissitis, corollæ lobis emarginatis.—*Benth. in DC. Prodr.* x. 553. (*Gunn*, 1220.)

Hab. Common on dry, hilly situations, Launceston, New Norfolk, Hobarton, etc.—(Fl. Oct.) (*v. v.*)

Distrib. Victoria, *Robertson;* New South Wales, *M'Arthur.*

This, which Bentham remarks is very closely allied to *E. alpina*, approaches nearest to the var. γ of that species, but appears to be truly annual, and is very much more slender and elongated; it also flowers earlier, but as it inhabits lower levels, that affords no proof of its specific distinctness.—Glabrous or minutely puberulous. *Stems* very much branched indeed (though small, almost simple specimens occur), very slender, 8–18 inches high. *Leaves* ¼–⅔ inch long, scattered, linear, obtuse, with recurved margins, three- to five-toothed, or sometimes almost pinnatifidly lobed. *Flowers* distant, with rather slender tubes, ½–⅔ inch long.

3. **Euphrasia multicaulis** (Benth. in DC. Prodr. x. 553); perennis, undique puberula, ramosissima, ramis breviusculis (8–10-pollicaribus), foliis (2–3-lin.) parvis obovato- v. oblongo-cuneatis pluri-crenatis, spica demum elongata, floribus confertis v. dissitis, calycibus brevibus breviter lobatis, corollæ lobis emarginatis. (*Gunn*, 863, 200, 1993, 1994, 1995.)

Hab. Abundant in many parts of the Island, and apparently in many soils and situations, but preferring marshy ground.—(Fl. Nov.–Jan.)

Distrib. South-western Australia?

I am unable to distinguish the forms collected by Gunn under the above numbers, though one of them (863) is stated to grow on sand-hills by the sea, and the others in rich moist and marshy land. As a species it (as Bentham remarks under *collina*) is very closely allied to *E. alpina*, nor do I think that it is possible to give any specific characters that will distinguish all the states of these three plants. The *E. multicaulis* is so common that it cannot have escaped Brown's notice, and hence no doubt comes under his *E. collina*, from which it may be distinguished by its perennial root, extremely numerous, short stems, about 8 inches high, and much broader leaves. The flowers vary from purple to white.

4. **Euphrasia scabra** (Br. Prodr. 437); annua, stricta, pedalis, scabra et glanduloso-pubescens, foliis lanceolatis dentato-incisis subpinnatifidisve dentibus obtusiusculis, calycis laciniis lineari-lanceolatis acutiusculis tubo suo longioribus, corollæ flavæ (4–6-lin.) puberulæ lobis integris v. vix retusis, capsula calyce longiore.—*Benth. in DC. Prodr.* x. 554. (*Gunn*, 167.)

Hab. Abundant about Circular Head, in dry and wet sandy soil, *Gunn;* Cheshunt, *Archer.*—(Fl. Dec., Jan.)

Distrib. South-eastern and South-western Australia, from Port Jackson to Swan River.

A remarkably distinct species, easily recognized by its rigid habit, scabridity, the incised or pinnatifid leaves, slender lobes of the calyx, and yellowish colour of the flower; the stems are a span to 16 inches high, the leaves 2–6 lines long. When dry the whole plant is of a pale colour.

5. **Euphrasia striata** (Br. Prodr. 436); humilis, cæspitosa, glanduloso-puberula v. glabrata, caulibus ascendentibus brevibus, foliis obovato-cuneatis bracteisque subpalmato-3–5-lobis, lobis obtusis, spica subovata densa, floribus omnibus imbricatis, calycis segmentis acutis glabris puberulisve, corollæ laciniis striatis retusis.

Hab. Tasmania, *Brown, Lawrence* (213); Western Mountains, *Archer.*

This appears to be a well-marked species, though most allied to the mountain form of *E. alpina*. It is probably perennial, and grows in dense tufted masses, throwing up ascending flowering-stems, 3–4 inches high. *Leaves* 2–4 lines long, covered with minute, glandular pubescence, broadly cuneate, coriaceous, 3–5-fid at the

apex, the lobes rather spreading, blunt; bracts similar, all grooved in the dry state; segments of the corolla hardly emarginate.

6. **Euphrasia cuspidata** (Hook. fil.); annua, humilis, glaberrima, caule simplici ascendente folioso, foliis late cuneatis apice incisis lobis lanceolatis cuspidatis, spicis oblongis densifloris, bracteis dense imbricatis late obovatis rotundatis pectinatim laciniatis lobis cuspidatis, calycis lobis acuminatis, antherarum loculis calcaratis.

Hab. Mount Sorrell, Macquarrie Harbour, *Milligan;* Western Mountains, *Archer.*—(Fl. Jan.)

A very remarkable little species, quite unlike any of those described above. Annual.—*Stems* in all my specimens quite simple, 3–4 inches high, nearly erect, perfectly glabrous, leafy. *Leaves* 3–4 lines long, suberect, very broadly cuneate, cut at the top into four to eight sharp, cuspidate lobes, the margins not recurved; the upper leaves are broader, and as broad as long. *Spikes* cylindrical, 1 inch long, $\frac{3}{4}$ broad, covered with densely imbricated bracts. *Bracts* very broadly obcuneate or rotundate, often broader than long, pectinately multifid, the lobes each simple and cuspidate. *Flowers* rather small. *Lobes* of the corolla emarginate or lobed, with a central apiculus. *Anthers* two-celled; cells each spurred, slightly hairy along the lines of dehiscence.—The plant turns perfectly black in drying.

Nat. Ord. LX. LENTIBULARIEÆ.

A very largely-represented Natural Order in all parts of Australia, though with few exceptions the species are all referable to the genus *Utricularia;* twenty-four species were known to Brown, to which have since been added about ten more.

Gen. I. UTRICULARIA, *L.*

Calyx alte bilabiatus, labiis subæqualibus. *Corolla* bilabiata, labio posteriore basi calcarato. *Stamina* 2; filamentis apice intus antheriferis, antheris 1- v. sub-2-locularibus. *Ovarium* 1-loculare; ovulis plurimis, placentæ basilari libero globoso affixis; stylo brevissimo; stigmate uni- v. bilabiato v. disciformi. *Capsula* polysperma. *Semina* parva, exalbuminosa; embryone tereti, interdum indiviso.—Herbæ *tenellæ, aquaticæ v. paludosæ;* foliis *radicalibus simplicibus v. decompositis radiciformibus v. vesiculiferis;* scapis *nudis v. bracteolatis, sæpius indivisis* 1*-floris v. spicatis v. racemosis.*

The species of this curious genus are, almost without exception, water or marsh plants, sometimes having long, floating, slender stems, covered with multifid, capillary leaves, that bear minute air-bladders and erect scapes; the terrestrial species again have often small, linear, inconspicuous leaves, and sometimes bladders also, attached to the roots or near them. the bladders are frequently open, and provided with a fringed operculum: they are beautiful microscopic objects.—*Flowers* on slender, naked, or rarely bracteate, filiform scapes, solitary or spicate, rarely subracemose, white, yellow, pink, or blue, very delicate. *Calyx* two-lipped; lips large, equal, entire, often very convex. *Corolla* two-lipped; upper entire or two-lobed; lower entire or three-lobed, its palate often provided with projections, spurred behind. *Stamens* two, ascending, placed at the throat of the corolla. *Anthers* one-celled, or constricted and spuriously two-celled, adnate to the inner face of the filaments. *Ovary* globose, one-celled, with many ovules on a globose, free, central receptacle. *Style* short, with a lobed or discoid stigma. *Capsule* two-valved. one-celled, many-seeded. (Name from *utriculus*, a little bladder.)

1. **Utricularia Australis** (Br. Prodr. 431); natans, caulibus intertextis, foliis capillaceo-multifidis vesiculiferis, scapo aphyllo paucifloro, floribus flavis, labiis indivisis inferiore duplo longiore quam lato, calcare ascendente antice plano subtus carinato. (*Gunn*, 1225.)

Hab. Pools near the South Esk River, near Launceston, *Gunn.*

Distrib. New South Wales and Victoria.

I have seen no flowers of this species, and have taken Brown's character, who further remarks that the species is very near to the European *U. vulgaris*.—A floating herb, with very slender, interwoven stems, covered with leaves about ½ inch long, which are cut into capillary segments, and bear small bladders, about 1–2 lines in diameter *Scape* erect, few-flowered; flowers yellow.

2. **Utricularia dichotoma** (Lab. Nov. Holl. i. 11. t. 8); acaulis, foliis linearibus oblongisve integris, scapo stricto semidemerso 2–8-floro, squamis nullis, pedicellis brevibus oppositis 3-bracteolatis, floribus amplis purpureis oppositis, sepalis ellipticis inferiore emarginato, corollæ labio superiore retuso emarginato, inferiore maximo securiformi integro, calcare obtuso.—*DC. Prodr.* viii. 14. U. speciosa, *Br. Prodr.* 430. (*Gunn*, 49.)

Hab. In pools of water and wet soil, abundant, ascending to 3500 feet.—(Fl. Oct.–Feb.)

Distrib. South-eastern Australia, New South Wales, and Victoria.

A very common and beautiful plant, forming a great ornament in marshy soil, etc. Specimens of Labillardière's *U. dichotoma*, communicated by Mr. Webb, enable me to verify Brown's supposition that his *U. speciosa* is the same; the specific name was no doubt given in allusion to the flowers being always opposite at the top of the scape; of these there are generally only one pair.—*Stem* none. *Roots* long and slender, bearing rather large gibbous bladders, 2 lines in diameter, with fimbriated lips. *Leaves* none, or linear or oblong. *Scapes* a span to a foot high. *Lower* lip very large, often ½ inch across, the shape of the blade of an axe.

3. **Utricularia uniflora** (Br. Prodr. 431); acaulis, scapo stricto tereti emerso unifloro, foliis radicalibus paucis subrotundis deciduis, labio superiore cuneiformi retuso, inferiore maximo securiformi integro, palato lobato, calcare obtuso.—*DC. Prodr.* viii. 14.

Hab. Tasmania, *Brown;* swamps on the Western Mountains, *Archer.*

Distrib. New South Wales.

This may be known from *U. dichotoma*, to which it is very nearly allied, by its smaller size, few, small, rounded, petiolate leaves, very slender scape, and solitary, much smaller flowers. I have seen no leaves on Archer's specimens, the only ones I have examined.

4. **Utricularia lateriflora** (Br. Prodr. 431); acaulis, foliis nullis?, scapo capillari simplici tereti basi minute squamuloso, floribus paucis lateralibus distantibus subspicatis, labio superiore lineari-oblongo subretuso, inferiore subrotundo obsolete crenulato, calcare retuso v. emarginato.—*A. DC. Prodr.* viii. 15. (*Gunn*, 896 *of* 1837, *et* 2033.)

Hab. Wet ground, Rocky Cape, and in sandy land near the Franklin River, *Gunn;* North-west Bay track, *Oldfield;* Western Mountains, *Archer.*—(Fl. Dec.–Feb.)

Distrib. New South Wales.

A very slender species, consisting of capillary scapes, 2–5 inches long, bearing two to four remote, lateral, almost sessile, small flowers. I have seen no leaves, and Brown describes none.—*Scape* with a few minute, appressed scales towards the base. *Flowers* about 3 lines across the corolla, whose lower lip is rounded, and the upper linear-oblong. *Spur* broad, blunt, generally notched at the apex.

5. **Utricularia monanthos** (Hook. fil.); exigua, acaulis, foliis radicalibus petiolatis lineari-spathulatis, scapo breviusculo 1-floro, lobis calycinis obtusis, corollæ purpureæ labio inferiore securiformi emarginato superiore lineari-obovato subretuso fauce piloso, calcare brevi emarginato. (*Gunn*, 896 *of* 1845.)

Hab. Wet sandy ground near Arthur's Lakes, *Gunn.*—(Fl. Jan.)

A very minute species, scarcely an inch high, stemless.—*Leaves* ¼ inch long including the petiole, narrow spathulate. *Scape* one-flowered; flower purple. *Lower lobe* of the corolla rounded, axe-shaped, notched; upper linear-obovate, emarginate. *Spur* short, broad, and notched.

Gen. II. POLYPOMPHOLYX, *Lehm.*

Calyx 4-partitus. Cætera ut in *Utricularia.*

There are several Australian *Utriculariæ* with four-lobed calyces, which have been raised to generic rank by Lehmann, under the above name, and at about the same time by Alphonse de Candolle, in the Appendix to the eighth volume of the 'Prodromus,' under that of *Tetralobus.* (Name from πολυς, *many*, and πομφολυξ, *a bubble.*)

1. **Polypompholyx tenella** (Lehm. in Bot. Zeit. ii. 110); pusilla, tenella, acaulis, radiculis vesiculiferis, foliis petiolatis spathulatis, scapo apice 1–3-floro, pedicellis 1-bracteolatis, floribus parvis roseis, corollæ labio superiore bifido, inferiore trifido, palato acuto puberulo, calcare obtuso.—*Lehm. in Plant. Preiss.* i. 341. Utricularia tenella, *Br. Prodr.* 432; *A. DC. Prodr.* viii. 16. (*Gunn*, 896?)

Hab. Flinders' Island, *Gunn.*

Distrib. South-eastern and South-western Australia.

My Tasmanian specimens are very imperfect, and I have improved my description from Australian ones.—A small, slender, stemless plant, 1½–2½ inches high. *Root*-fibres minute, often bearing small bladders. *Leaves* very minute, often numerous, all radical, ¼ inch long, spathulate or elliptical. *Scape* slender, one- to three-flowered. *Flowers* about 3–4 lines across. Upper lip of corolla bilobed; lower more deeply three-lobed; lobes linear-oblong, blunt.

Nat. Ord. LXI. PRIMULACEÆ.

The few Australian representatives of this Order belong to the European genera *Lysimachia* and *Samolus*, together with single species of *Micropyxis* and *Euparæa*, the former a genus of three species, inhabiting South America, Madagascar, and Australia, and the latter confined to Australia. Several species of *Samolus* are found, and of *Lysimachia* two; one of them, the common European *L. vulgaris*, was detected by the indefatigable Mueller in the previously unexplored wilds of the Australian alps, but occurs nowhere else in the Southern hemisphere.

Gen. I. SAMOLUS, *L.*

Calyx semi-adhærens, 5-fidus. *Corolla* perigyna, hypocrateriformis, decidua, limbo 5-partito. *Stamina* 5, antherifera, laciniis corollæ opposita, cum 5 sterilibus squamæformibus alternantia. *Ovarium* semi-inferum; ovulis plurimis placentæ centrali affixis; *stylo* erecto; *stigmate* simplici. *Capsula* semi-5-valvis. *Semina* angulata, umbilico lateri exteriori opposito, albuminosa; embryone recto, axili, umbilico parallelo. —Herbæ; caule *simplici v. ramoso;* foliis radicalibus *petiolatis*, caulinis *alternis;* floribus *corymbosis racemosisve.*

About eight species of *Samolus* are known in Australia, of which one, *S. Valerandi*, is found in many extra-tropical countries, in both the north and south hemisphere, and its absence in Tasmania is remarkable; and another, *S. littoralis*, is also a native of New Zealand and Polynesia, and South Chili.—*S. littoralis* is the only Tasmanian species, and forms a small, rather rigid, branching, prostrate, rarely erect, perennial, seaside herb, with a suffruticose base to the stem; glabrous everywhere.—*Branches* terete, 3–13 inches long, more or less leafy, the leaves ascending when the stems are prostrate. *Leaves* very variable in size and breadth, radical ½–2 inches long, petiolate, spathulate, blunt or acute; cauline generally linear-spathulate or elliptic, acuminate, ½ inch long, rarely broadly spathulate, or even almost orbicular. *Flowers* white, solitary and axillary, subcorymbose, pedicellate. *Calyx* half-inferior, its five lobes narrow and acute. *Corolla* campanulate, five-lobed. *Stamens* five, opposite the segments of the corolla, alternating with five scales. *Seeds* numerous, on a central placenta. (Name, according to Pliny, applied to some marsh plant.)

1. **Samolus littoralis** (Br. Prodr. 428); polymorpha, glabra, caule prostrato rarius suberecto, ramis ascendentibus foliosis, foliis radicalibus spathulatis caulinis late v. anguste lanceolatis spathulatisve, floribus axillaribus solitariis v. ad apices ramorum subcorymbosis, pedicellis axillaribus bracteatisve, calycis semisuperi laciniis angustis acuminatis.—*A. DC. Prodr.* viii. 73; *Fl. N. Zeal.* i. 207. Shefflerdia repens, *Forst. Gen. Pl.* 18. *t.* 9; *Linn. Suppl.* 135. S. incana, *Lab. Nov. Holl.* i. 40. *t.* 54. (*Gunn*, 381.)

Hab. Abundant on all the coasts, especially in saline mud, etc.—(Fl. all Summer.) (*v. v.*)

Distrib. Coasts of tropical and extratropical Australia, New Zealand, Polynesia, and South Chili.

Nat. Ord. LXII. PLUMBAGINEÆ.

With the exception of the common tropical littoral *Ægialitis* of India, which inhabits the north coasts of Australia, and the ubiquitous *Plumbago Zeylanica* (also a tropical plant), there is but one genus of the Order known to inhabit that vast continent, to which however (and Tasmania) the species is peculiar, and is the sole representative of the great genus *Statice* of Europe and Western Asia.

Gen. I. STATICE, *L.*

Calyx tubulosus v. infundibuliformis, limbo scarioso plicato 5-nervi, 5-(rarissime 10-) lobo. *Corolla* polypetala v. gamopetala. *Stamina* 5, corollæ inserta. *Ovarium* oblongum v. lineare, 1-loculare, 1-ovulatum. *Styli* 3–5, distincti v. basi connati. *Utriculus* membranaceus. *Semen* albuminosum.—Herbæ *v.* suffrutices; rhizomate *duro;* foliis *radicalibus, petiolatis, integris;* scapis *ramosis;* floribus *secundis.*

Statice Australis is the only Australian species, and scarcely differs from the European *S. Limonium*, except in the angled branches of the panicle. It is a rigid, saline herb, with a hard, woody rhizome, glabrous, petiolate, spathulate, rather coriaceous, radical leaves, 1–2 inches long, and branching, angled scapes, bearing small, secund spikelets of flowers. (Name from στατιζω, *to stop;* in allusion to some supposed astringent property.)

1. **Statice Australis** (Spreng. Syst. Veg. i. 959); glabra, foliis petiolatis oblongo-spathulatis obtusis muticis 1-nerviis, scapis acute angulatis sulcatis subcorymboso-paniculatis, ramis strictis elongatis, spicis ovatis secundis, spiculis 4–5-floris appressis inferioribus distantibus, bracteis ovatis carinatis acutis nervo percurrente dorso herbaceis margine membranaceis, calycis tubo basi obliquo glaberrimo limbi lobis 5 ovatis mucronulatis.—*Boissier in DC. Prodr.* xii. 642. Taxanthema Australis, *Br. Prodr.* 427. (*Gunn*, 375.)

Hab. Common on the coasts, in mud, at high-water mark, with *Salicornia*, etc.—(Fl. March.)

Distrib. Shores of tropical and extratropical Australia.

Nat. Ord. LXIII. PLANTAGINEÆ.

Gen. I. PLANTAGO, *L.*

Flores hermaphroditi, spicati v. capitati, bracteati. *Sepala* 4, subæqualia. *Corolla* tubulosa, scariosa, 4-loba, persistens, marginibus loborum plerumque involutis. *Stamina* 4, plerumque longe exserta, filamentis flaccidis, antheris magnis cordatis. *Ovarium* 2–4-loculare, loculis 1–8-ovulatis. *Stylus* simplex. *Capsula* membranacea, basi circumscissa, septo demum libero faciebus seminiferis. *Semina* hilo ventrali, in capsulis polyspermis parva, in 2-spermis cymbiformia; testa mucilaginosa, albumine dense carnoso, embryone hilo parallelo recto v. curvato.—Herbæ *caulescentes v. acaules;* foliis *plerisque omnibus radicalibus, erectis*

v. stellatim patentibus, integris dentatis margine lobatisve; pedunculis *axillaribus, erectis v. ascendentibus;* floribus *plerumque dense spicatis, fuscis;* bracteis *sub quovis flore cymbiformibus.*

About twenty species of this genus are described as Australian by Decaisne in the thirteenth volume of De Candolle's 'Prodromus;' none of them are wholly tropical, and the greater number are natives of Tasmania, and confined to that island.—Herbaceous, scapigerous plants, with stout, often fleshy rhizomes, and numerous radical leaves. Decaisne divides the Australian species into those with annual and perennial roots, but I believe all are perennial, though when grown on sterile soil they often do not survive a second year.—*Flowers* sessile, bracteate, green or brownish, usually in dense or lax, elongated spikes, rarely solitary, or two or three, terminating long or short scapes. *Calyx* of four persistent sepals. *Corolla* tubular, scariose, with a spreading, four-lobed limb; the lobes often with involute margins. *Stamens* four, exserted, situated at the mouth of the corolla, and alternating with its lobes; anthers versatile; filaments induplicate in æstivation. *Ovary* two- or incompletely four-celled; cells one- to four-seeded. *Style* long, filiform, hispidulous. *Capsule* circumsciss, with a longitudinal dissepiment, that bears the seeds. *Seeds* peltate, with a mucilaginous testa, densely fleshy albumen, and straight embryo. (Name, the Latin one.)

§ 1. *Flowers in dense or lax, many-flowered spikes. Ovary two-celled; cells with two ovules, of which one occasionally does not ripen.*

a. *Sepals and bracts pubescent.*

1. **Plantago varia** (Br. Prodr. 424); hispido-pilosa, subtomentosa, foliis suberectis anguste lanceolatis integris v. repando- v. runcinato-dentatis petiolo basi pedunculoque plerumque barbatis, spicis oblongo-cylindraceis sublaxifloris, bracteis cymbiformibus calycem subæquantibus, sepalis ovalibus obtusis carina lineari hispida v. pubescente, corollæ lobis rotundato-cordatis acuminatis fuscis, capsula 4-sperma.—*Dene. in DC. Prodr.* xiii. 701; *Rapin, Plantag.* 463; *Barneoud, Monog. Plant.* 15; *Nees in Plant. Preiss.* 490. P. runcinata, *Dene.? l. c. p.* 702. (*Gunn*, 141.)

Hab. Abundant everywhere, especially in a light soil.—(Fl. all Summer.) (*v. v.*)

Distrib. Subtropical Eastern Australia, New South Wales, Victoria, and Swan River.

Very variable in size, from 1 inch to a span high, everywhere more or less covered with spreading, rather hispid hairs.—*Leaves* 1–5 inches long, very narrow-lanceolate, subacute, entire or toothed, or with narrow, lateral lobes. *Petiole* and peduncle with fuscous or brown hairs at the base. *Peduncle* erect. *Spike* 1–3 inches long, cylindrical; flowers loosely packed, but not so separated as to show the rachis between them. *Bracts* equal in length to the calyx. *Sepals* with membranous margins, and a thick, hispid, pilose or tomentose, central rib. The hairs at the base of the petiole and peduncle are very variable in quantity, and sometimes almost absent, so that I suspect that this and Brown's *P. hispida* may not differ specifically. I have small specimens from Mr. Oldfield, collected on rocks near Richmond, with only three- to five-flowered spikes, and the petioles and peduncle not bearded at the base; it is evidently a starved form of *P. varia*. *P. runcinata* is sent by Gunn, from Tasmania, as *P. varia*, of which it appears to be a common variety; Decaisne distinguishes it by being perennial, and having the leaves runcinate, but I am unable to distinguish the annual from the perennial species of this section, and had always regarded *P. varia* as a perennial, which Mr. Archer also believes to be the case with all the Tasmanian species. Decaisne describes another species, *P. consanguinea*, as a doubtful native of Tasmania, and allied to *P. varia* and *P. runcinata*, but distinguished by the entire leaves and *pale corollas*.

2. **Plantago bellidioides** (Dene. in DC. Prodr. xiii. 701); annua, hispido-pilosula, foliis patentibus petiolatis spathulatis integerrimis denticulatis v. subrepando- v. runcinato-dentatis, petiolis pedunculoque basi barbatis, pedunculis ascendentibus gracilibus, spicis ovatis cylindraceis ovato-oblongisve, floribus ut in *P. varia*.—P. runcinata, *Dene.? l. c.* 702. (*Gunn*, 867.)

Hab. Common on sand-hills at Circular Head, also on the Hampshire Hills, *Gunn;* Western Mountains, *Archer.*—(Fl. Sept.–Nov.)

This differs from *P. varia* in its smaller size, broader, spreading leaves, more slender, ascending scapes, and shorter spikes; the base of the petiole and peduncle are also less bearded. Decaisne describes the lobes of the corolla as having a dark spot at their base, a character which I find also in some specimens of *P. varia;* the peduncles vary in length from being as long as, to twice as long as, the leaves. Some of Archer's specimens are almost intermediate between this, *P. varia* and *P. Antarctica,* and agree with Decaisne's *P. runcinata.*

b. *Bracts and sepals glabrous.*

3. **Plantago Antarctica** (Dene. in DC. Prodr. xiii. 703); foliis lanceolatis obtusis integerrimis repando-denticulatisve 3–5-nerviis utrinque hispidis tomentosisve in petiolum brevissimum attenuatis subsessilibus, pedunculis folia duplo v. longe superantibus gracilibus pubescentibus erectis, spicis cylindraceis ovatisve densifloris, bracteis subdeltoideis glaberrimis calyce parum brevioribus, foliolis calycinis rotundatis subæqualibus glaberrimis, corollæ lobis rotundato-cordatis acutiusculis linea media basique fuscis, capsula abortu 2-sperma, placentario obtuso.—*Affinis* P. variæ, *sed flores glaberrimi.* (*Gunn,* 1997.)

Hab. Tasmania, *Verreaux;* Marshes of St. Patrick's River, north-east of Launceston, *Gunn;* Cheshunt, *Archer.*—(Fl. Dec.)

Very similar to some states of *P. bellidioides,* but with shorter petioles, and almost sessile, elliptical-lanceolate leaves, 3–5 inches long, densely pubescent, villous or naked at the base. *Peduncles* long, slender, pubescent. *Spikes* ½–2 inches long, quite like those of *P. varia,* but with usually glabrous bracts and calyces.—I find occasionally a few hairs on the calyx.

4. **Plantago Archeri** (Hook. fil.); foliis stellatim patentibus obovato-spathulatis obtusis integerrimis molliter tomentosis basi barbatis, pedunculis villosis, spica ovato-cylindracea densiflora, bracteis cymbiformibus glaberrimis carnosis marginibus anguste membranaceis ciliatis calycem æquantibus, sepalis oblongis acuminatis glaberrimis margine late membranaceis, corollæ lobis parvis anguste ovatis acuminatis linea fusca lata.

Hab. Western Mountains, near Cumming's Head, *Archer.*

A remarkable, distinct, and singular little species. Perennial.—*Leaves* appressed to the ground, ⅔–1½ inch long, shortly petioled, spathulate-oblong, quite entire, densely covered with a soft, grey-green tomentum on both surfaces, quite entire, blunt, coriaceous, nerveless, the petioles with silky, villous hairs at the base. *Peduncles* shorter than the leaves, but probably variable in length, villous with long hairs. *Spike* ⅓ inch long, cylindrical, ovate. *Flowers* crowded, very small. *Bracts* glabrous, coriaceous or almost carnose, reddish on the sides of the back, with a narrow, membranous, ciliate margin. *Calyx* quite glabrous. *Petals* with small, acuminate, fuscous lobes.—I have seen only two specimens of this species, and some allowance for variation must hence be allowed to the description.

5. **Plantago Tasmanica** (Nob. in Lond. Journ. Bot. vi. 276); foliis lanceolatis obovato-lanceolatis spathulatisve integerrimis v. sinuato-dentatis 1-nerviis, pedunculis gracilibus ascendentibus sparse pubescentibus, spicis ovatis cylindraceisve, bracteis ovato-deltoideis calyce brevioribus glabratis marginibus ciliatis, sepalis subacutis glaberrimis, corollæ lobis acuminatis, capsulæ loculis 2-spermis.

Var. *α*; foliis utrinque hispido-pilosis tomentosisve basi sericco-barbatis, corollæ lobis lanceolatis.—P. Tasmanica, *Nob. l. c.; Dene. in DC. Prodr.* xiii. 703. (*Gunn,* 866.)

Var. *β. glabrata;* foliis lanceolatis dentatis glabratis basi nudis, pedunculis folio ter longioribus, spicis ovatis, corollæ lobis orbiculari-ovatis.—P. glabrata, *Nob. l. c.; Dene. l. c.* (*Gunn,* 1228.)

Var. *γ. Daltoni;* foliis glabrioribus elliptico- v. lineari-lanceolatis longius petiolatis basi barbatis

pedunculis gracilibus, spicis angustioribus elongatis paucifloris, floribus interdum dissitis, corollæ lobis oblongo-lanceolatis.—P. Daltoni, *Dcne. l. c.* P. leptostachys, *Nob. l. c.* (*Gunn*, 1228?)

Hab. Abundant in wet and marshy places on the mountains, elev. 3–4000 feet. Var. *α*. Mount Wellington. Var. *β*. Arthur's Lakes, *Gunn;* Western Mountains, *Archer*. Var. *γ*. Lake St. Clair, *Gunn;* Western Mountains, *Archer*.—(Fl. Dec., Jan.)

After a very careful re-examination of all Gunn's specimens, upon which I founded the three species here brought together, and a comparison of these with others from Gunn and Oldfield, with Gunn's notes, and with a very good series of varieties selected by Archer, I have no hesitation in considering them as one. This is in fact the common alpine *Plantago* of Tasmania, and, like all other alpine plants, is an extremely variable one, and the fact of Gunn's finding a different variety in every mountain locality, is an evidence of this. Like *P. varia* it differs extremely in the amount of soft hairs at the base of the leaves, these sometimes forming a dense matted mass at the collum, surrounding all the petioles, and at others being partially or wholly absent in plants that are in all other characters the same. The flowers are always glabrous, but the bracts have long cilia on the margins. The shape of the lobes of the corolla, which I once supposed formed good diagnostic marks, I now perceive to vary very much indeed.

§ 2. *Flowers capitate, very few (one to three).*

6. **Plantago Brownii** (Rapin, Hist. Nat. Plantag. 484); cæspitosa, acaulis, collo crassissimo, foliis plurimis confertis stellatim patentibus crassis carnosis lanceolatis spathulatisve inciso-dentatis runcinatisve glaberrimis v. pilosis basi nudis, pedunculis plurimis brevibus, spicis capitatis 1–4-floris, sepalis ovatis breviter acuminatis, corollæ lobis ovalibus, capsula globosa 6–8-sperma.—*Dcne. in DC. Prodr.* xiii. 727. P. carnosa, *Br. Prodr.* 425, *non Lamk.; Barneoud, Plant.* 18; *Fl. Ant.* i. 65. *t.* 43; *Fl. N. Zeal.* i. 207. P. triantha, *Spreng. Syst.* i. 439. (*Gunn*, 1227.)

Hab. Tasmania, *Brown;* Coal Cliff at South Cape, *Gunn*.—(Fl. Dec.)

Distrib. New Zealand; Lord Auckland's Island.

A small, very fleshy species, growing closely appressed to maritime rocks, in the crevices of which it pushes its fleshy roots, whilst the numerous fleshy, bright green leaves are spread out like a star.—*Root* perennial, very thick. *Leaves* very numerous, densely imbricating, 1–3 inches long, petiolate, lanceolate or elliptical, nearly entire or runcinate, toothed. *Peduncles* stout, shorter or longer than the leaves, with three to five terminal flowers.

7. **Plantago paradoxa** (Nob. in Lond. Journ. Bot. vi. 277); pumila, foliis lanceolatis sessilibus v. breve petiolatis integerrimis v. sinuato-dentatis, pilis paleaceis albidis hispidis v. glabratis, pedunculis brevissimis paleaceis 1–3-floris, sepalis ovato-rotundatis glabratis, corollæ lobis ovatis acutis, capsulæ loculis 4-spermis.—*Dcne. in DC. Prodr.* xiii. 728. (*Gunn*, 881.)

Hab. Black Bluff Mountain and Lake St. Clair, *Gunn;* Rocks near Mount Gay, on the Mersey, *Archer*.—(Fl. Jan.)

A very curious species, similar in many respects to *P. carnosa*, but the habit is different, the leaves are more entire, less fleshy, and generally hispid, and the flowers are very frequently solitary. In some specimens the hairs (which are jointed paleæ) are disposed in bands across the upper surface of the leaf.

7. **Plantago Gunnii** (Nob. in Lond. Journ. Bot. v. 446. t. 13); pumila, pulvinatim cæspitosa, caulibus elongatis divisis gracilibus foliosis, foliis anguste ovato-oblongis subacutis concavis basi in petiolum vaginantem angustatis integerrimis marginibus longe ciliatis, pedunculis brevibus 1-floris, bracteis calycem subæquantibus, sepalis ovatis acutis, capsulæ loculis 1-spermis.—*Dcne. in DC. Prodr.* xiii. 729. (*Gunn*, 1998.)

Hab. Loftiest parts of the Western Mountains, forming green cushions, *Gunn, Archer*.—(Fl. Jan.)

A curious little plant, very dissimilar in habit from any of its congeners, forming matted tufts of slender, leafy, branched stems, 1–2 inches long. *Stems* covered below with the withered leaf-sheaths. *Leaves* closely imbricating, erecto-patent, $\frac{1}{4}$–$\frac{2}{3}$ inch long, lanceolate, acuminate, very concave, narrowed into a membranous, sheathing petiole, pilose above, glabrous on the back, margins with long cilia. *Peduncles* pilose, longer than the leaves. *Flowers* solitary.

Obs. *Plantago Coronopus*, L. (Gunn, 1999), has been introduced into the neighbourhood of Georgetown, where it was found by Gunn in 1844, abundantly. It is also introduced into the Swan River Colony; it may be known by its hispid, deeply runcinate or pinnatifid leaves, very stout, curved, ascending peduncles, and dense, cylindrical spikes of flowers, with spuriously four-celled ovaries.

Nat. Ord. LXIV. POLYGONEÆ.

In his excellent revision of this Order, which has just appeared in De Candolle's 'Prodromus,' M. Meisner enumerates twenty-eight Australian species, all belonging to the genera *Rumex*, *Polygonum*, and *Muehlenbeckia*, of which the latter alone is more common in the southern than in the northern hemisphere; by much the larger proportion of these are confined to the south-east quarter of Australia and Tasmania, only two or three being found in the south-west.

Gen. I. RUMEX, *L.*

Perianthium 6-partitum, foliolis biseriatis, 3 interioribus fructu auctis. *Stamina* 6, perianthii foliolis alterna. *Ovarium* 3-angulare. *Stigmata* 3. *Nux* triquetra, perianthii laciniis interioribus acutis valvæformibus tecta.—Herbæ; foliis *integris*; stipulis *ocreæformibus*; floribus *irregulariter paniculatim racemosis*; floribus *viridibus v. rubris*.

A very common European genus, also found in all other temperate regions, and in the tropics sparingly.—*Herbs*, with usually perennial roots, alternate leaves, with ocreate stipules, and branched, panicled racemes of inconspicuous flowers. *Perianth* of six green or reddish leaflets, in two rows, imbricate. *Stamens* six, alternate with the leaflets of the perianth. *Ovary* three-angled, with three styles and fimbriate stigmata. *Nut* pendulous from the curved pedicel, three-angled, enclosed in the appressed, greatly enlarged, inner leaflets of the perianth, which are often toothed or armed. (Name of unknown origin.)

1. **Rumex Brownii** (Campd. Rum. 64); caule ramoso, internodiis elongatis, foliis petiolatis e basi cuneata truncata v. subhastata elongato-lanceolatis obtusis acuminatisve marginibus planis undulatisve, racemis indivisis elongatis aphyllis, verticillis remotis, pedicellis crassiusculis, valvis ovato-ellipticis subulato-acuminatis ecallosis marginibus 3–5-spinosis, spinis elongatis hamatis.—*Meisn. in DC. Prodr.* xiv. 61. R. fimbriatus, *Br. Prodr.* 421, *non Poir.* (*Gunn*, 897.)

Hab. Abundant in marshy places near Circular Head.—(Fl. Nov., Dec.)

Distrib. New South Wales and Victoria.

Stems sparingly or much branched, 1–3 feet high. *Leaves* petiolate; cauline and radical similar, a span long, narrow-lanceolate, with a cuneate, truncate, or subhastate base, margin flat or crisped, point blunt or acuminate. *Flowers* whorled, in long racemes, hermaphrodite. *Valves* of the fruit elliptical-ovate, acuminate, cut at the margin into many long, hooked spines.

2. **Rumex bidens** (Br. Prodr. 421); caule erecto simplici v. diviso, foliis elongato-lanceolatis acutis obtusisve e basi inæquilatera obtusa subcordata v. attenuata marginibus planis crispatulisve summis linearibus, verticillis remotis inferioribus axillaribus, pedicellis medio articulatis apice incrassatis, valvis majusculis

triangulari-ovatis apice attenuato-obtusis marginibus utrinque in spinam brevem v. subelongatam crassiusculam productis.—*Meisn. in DC. Prodr.* xiv. 73. R. Mülleri, *Meisn. l. c.* 61. (*Gunn*, 403, 1231.)

Hab. Common in marshes in the northern parts of the Island: near Launceston, Georgetown, etc.—(Fl. Nov.)

Distrib. Victoria, *Mueller, Robertson, etc.*

Root creeping, and throwing up numerous stems, so that the plants cover the ground in large patches.—*Stems* 2–3 feet high, simple or sparingly branched. *Leaves* very narrow, a span to a foot long, blunt or acuminate, with flat or crisped margins, and the base blunt, sharp, or almost cordate, always inæquilateral. *Lower* whorls of flowers axillary. *Flowers* unisexual. *Valves* of the fruit triangular, ending in a blunt, narrow point, the margins produced into a long or short, blunt or sharp tooth.

Gen. II. POLYGONUM, *L.*

Flores hermaphroditi. *Perianthium* 4–5-partitum, laciniis fructu appressis haud auctis. *Stamina* 4–8, sæpius 8. *Ovarium* compressum v. trigonum. *Nux* calyce sicco immersa, trigona v. compressa.—Herbæ, *rarius* frutices; foliis *alternis, sessilibus petiolatisve, basi v. medio stipulæ ocreiformæ adnatis;* floribus *albis v. rubris, solitariis v. spicatis, rarius racemosis;* pedicellis *articulatis.*

Of this large and cosmopolitan genus there are about fifteen known Australian species, several of which are certainly peculiar to Australia and Tasmania, but some will no doubt prove to be varieties of widely-diffused species. As a genus, *Polygonum* is known from *Rumex* by its different habit, and by the leaflets of the perianth not becoming dilated over the fruit, and from *Muehlenbeckia* by the perianth not becoming fleshy and baccate. The stamens (usually eight) vary in number in the different species, and sometimes in each; and the nuts, though generally constantly flat or trigonous in each species, in some vary also. (Name from πολυς, *many*, and γονυ, *a joint;* in allusion to the jointed stems.)

1. **Polygonum minus** (Huds. Fl. Angl. i. 148); glaber, caule gracili decumbente demum erecto, ocreis longe ciliatis, foliis breve petiolatis lanceolatis glabris marginibus minute ciliolatis, spicis solitariis subracemosisve laxiusculis erectis, bracteis breve turbinatis truncatis pedicellos superantibus ore glabris v. ciliatis, staminibus 5–8, nuce lenticulari v. trigona nitida.—*Meisn. in DC. Prodr.* xiv. 111; *Engl. Bot. t.* 1043. P. decipiens, *Br. Prodr.* 420; *Meisn. l. c.* P. prostratum, *A. Cunn. Prodr. Fl. N. Zeal., non Br.; Nob. in Fl. N. Zeal.* i. 208. (*Gunn*, 40.)

Hab. Common in the northern parts of the Island, about Launceston, etc.—(Fl. Nov.)

Distrib. South-eastern Australia, from the tropics to Victoria; Swan River; New Zealand; all Europe; temperate and subtropical Asia, and North Africa.

Some of my Tasmanian specimens agree with Brown's character of *P. decipiens* in the glabrous bracts, but in others this organ is strongly ciliated; all have trigonous nuts, though *P. minus* has, in New Zealand and in other countries, more frequently compressed nuts. The leaves are scabrid, with minute cilia on the margin, which are sometimes almost obsolete.—A slender, glabrous herb, a span to 18 inches long. *Stems* slender, procumbent, ascending, simple or rarely branched. *Ocreæ* with long cilia at the mouth. *Leaves* lanceolate, 2–3 inches long, glabrous on both surfaces. *Spikes* solitary or subracemose, strict, erect, about $1\frac{1}{2}$ inch long. *Flowers* rather lax. *Bracts* cuneate, truncate, as long as the pedicels.

2. **Polygonum subsessile** (Br. Prodr. 419); caule gracili laxe ramoso elongato ascendente appresse strigoso, ocreis pilosis strigoso-ciliatis, foliis subsessilibus lanceolatis obtusiusculis utrinque appresse substrigosis, spicis cylindraceis pedunculatis solitariis subracemosisve, bracteis cuneatis ciliatis, floribus 5-andris glabris, nuce lenticulari turgida.—*Meisn. in DC. Prodr.* xiv. 113. (*Gunn*, 42.)

HAB. Northern parts of the Island, Launceston, *Gunn.*—(Fl. Nov.)
DISTRIB. New South Wales and Victoria.

Similar in general appearance to *P. minus*, but very distinct, and easily recognized by the rigid, appressed hairs on the red stem, sheaths, both surfaces of the leaves, peduncles, and bracts. The leaves also are more sessile, blunt, or hardly acute, and the nut is lenticular and very turgid. *Stipules* with long, rigid cilia. *Spikes* terminal and axillary.

3. **Polygonum strigosum** (Br. Prodr. 420); caule gracili basi decumbente dein erecto angulato, ocreis petiolis nervisque subtus strigosis retrorsum aculeolatisve, ocreis membranaceis bracteisque acutis ciliatis, foliis petiolatis oblongis oblongo-lanceolatis basi rotundatis truncatis sagittatisve, spicis geminis axillaribus terminalibusque longe gracile pedunculatis laxe paucifloris, floribus dissitis glabris, nuce lenticulari turgida.—? P. strigosum, *Meisn. in DC. Prodr.* xiv. 134. (*Gunn*, 41.)

HAB. Northern parts of the Island, Launceston, *Gunn.*—(Fl. Feb., March.)
DISTRIB. South-eastern Australia, from the Brisbane River to Victoria.

I have doubtfully quoted Meisner's *P. strigosum* under this, as I do not find the ocreæ to be elongated, nor having appressed cilia, nor the spikes to be dense, these being in all my specimens small, few-flowered, with the flowers distant. The angled stem, petioled, hastate, oblong or lanceolate leaves, slender, few-flowered spikes, and above all, the recurved prickles, which infest the stem, petioles, nerves beneath, and peduncles, well characterize the species. The leaves are very variable in form.

4. **Polygonum prostratum** (Br. Prodr. 419); caule prostrato ramoso piloso, ocreis brevibus laxis ciliatis (interdum apice foliaceis), foliis breve petiolatis lanceolatis glabris pilosisve margine nervisque ciliatis, spicis axillaribus terminalibusque brevibus oblongis breve pedunculatis, bracteis imbricatis turbinatis glabris ciliatisve pedicellos superantibus, staminibus 5, nuce lenticulari.—*Meisn. in DC. Prodr.* xiv. 116. (*Gunn*, 43.)

HAB. Not uncommon in various parts of the Island.—(Fl. Dec.)
DISTRIB. Extratropical Eastern and Western Australia.

Stems woody at the base. *Branches* numerous, spreading, much divided, prostrate, a span to 18 inches long, covered with long, lax hairs. *Ocreæ* short, loose, membranous, ciliated, in some of Gunn's specimens bearing at the mouth a short, foliaceous lamina. *Leaves* subsessile, attached to the middle of the ocrea, narrow-lanceolate, $1\frac{1}{2}$–4 inches long, pilose or glabrous on both surfaces. *Spikes* small, shortly peduncled, axillary or terminal, usually solitary. *Flowers* imbricated. *Bracts* turbinate, lax, ciliated or glabrous, two- or three-flowered.—The New Zealand plant referred to this, by Cunningham and others, is probably *P. minus*, as is certainly that so called by myself in the New Zealand Flora.

Gen. III. MUEHLENBECKIA, *Meisn.*

Flores polygamo-dioici. *Perianthium* 5-partitum, fructifer auctus v. baccatus. MASC. *Stamina* 8, rudimento pistilli 0. FŒM. ET HERM. *Stamina* 8; antheris effœtis v. nullis. *Ovarium* trigonum, stylis 3, v. stigmatibus subsessilibus. *Nux* trigona, perianthio sicco v. baccato immersa, endocarpio inflexo spurie semi-3-loculari. *Semen* profunde trilobum.—Frutices *v.* suffrutices *prostrati v. volubiles;* ramis *sulcatis angulatisve;* ocreis *membranaceis, imberbibus;* foliis *petiolatis, sæpe carnosulis;* floribus *albis v. virescentibus, axillaribus, solitariis, spicatis racemosis paniculatisve;* pedicellis *cum calyce articulatis.*

This genus, which is often considered a section of *Polygonum*, differs from the ordinary forms of that genus in its more shrubby habit, often twining stems, and in the perianth often becoming enlarged in fruit, and even forming a more or less fleshy berry round the trigonous nut. The flowers are generally unisexual, and sometimes polygamous; the male flowers have no trace of ovary, but the female have imperfect stamens. About four or five Aus-

tralian species are known, and as many New Zealand; the remainder are natives of the Pacific, and Central and Southern America. (Named in honour of *Dr. G. Muehlenbeck*, an investigator of the botany of Alsace.)

1. **Muehlenbeckia adpressa** (Meisn. Gen. ii. 227); glaberrima, caule volubili (rarius prostrato), ramisque flexuosis sulcatis v. angulatis, ocreis brevibus laceris deciduis, foliis petiolatis oblongis rotundatisve basi hastatis cordatis truncatisve integerrimis subcarnosis, racemis axillaribus terminalibusque interruptis, bracteis brevibus pedicellos subæquantibus, stigmatibus subsessilibus papillosis, nuce globoso-trigona. —*Meisn. in DC. Prodr.* xiv. 146. Polygonum appressum, *Lab. Nov. Holl.* i. 99. *t.* 127; *Br. Prodr.* 420. Sarcogonum appressum, *Sweet, Brit. Fl. Garden, ed.* 3, 577.

Var. *a. rotundifolia* (Meisn. l. c.); foliis ovalibus rotundatisve basi truncatis hastatis cordatisve. (*Gunn*, 432.)

Var. *β. hastifolia* (Meisn. l. c.); foliis oblongis ovato-oblongisve basi hastatis truncatis v. cuneato-attenuatis.—P. adpressum, *Hook. Bot. Mag. t.* 3145. P. Gunnii, *Nob. in Lond. Journ. Bot.* vi. 278. (*Gunn*, 325.)

Hab. Var. *a.* Sandy shores of the northern coasts. Var. *β.* In dense, humid forests on the west coast, and interior of the Island, *Gunn.*—(Fl. Oct.–Jan.)

Distrib. Var. *a.* New South Wales, Victoria, and Swan River; New Zealand and Norfolk Island? (Cultivated in England.)

I have repeatedly examined the two Tasmanian states of this plant, and compared them with the Australian, and with the *M. Australis* (*Coccoloba Australis*, Forst.) of New Zealand and Norfolk Island, and am in doubt whether they should be regarded as three varieties or species. In the 'London Journal of Botany' I distinguished the var. *β* of Tasmania as a new species, *M. Gunnii*, about whose specific distinctness Gunn has no doubts whatever, but this Meisner has since united with *M. adpressa*. In the New Zealand Flora again I united the New Zealand and Norfolk Island plant with the *M. adpressa*, var. *α*, but these Meisner keeps distinct, relying chiefly on the more membranous leaves, more graceful habit, and fimbriated stigmata of the New Zealand plant, for distinguishing them. Of these characters I cannot confirm that of the stigmata, and those of the habit and texture of the leaf are of little importance, but I would add the much more acuminate leaf, which is three-lobed in young specimens, and smaller, less fleshy perianth. With regard to the differences between the var. *α* and *β* of *M. adpressa*, they are quite as marked, though I doubt their being of specific value: Gunn well sums them up, in saying that the *M. adpressa* is a maritime plant, with trailing stems, sometimes climbing for 6 feet or so over rushes, etc., and with round blunt leaves at the ends of the twisted branches, with somewhat revolute margins, and smaller flowers and fruit; whilst the var. *β* always grows in the richest soil, in dense, humid, shaded forests, ascending to the tops of lofty trees, and sending out long, straight shoots; it has longer, acuminate leaves, and larger flowers and fruit.

2. **Muehlenbeckia axillaris** (Nob. in Lond. Journ. Bot. vi. 278); fruticulus subcæspitosus v. diffusus humilis glaberrimus, ramulis brevibus rigidis flexuosisve, ocreis persistentibus, foliis (parvis) subcoriaceis ellipticis ovalibus obovatis rotundatisve obtusis, floribus axillaribus solitariis v. subfasciculatis.—*Fl. N. Zeal.* i. 210; *Meisn. in DC. Prodr.* xiv. 147. (*Gunn*, 76.)

Hab. In moist places in various parts of the Colony, ascending to 4000 feet; Launceston, Vale of Belvoir, Marlborough, etc., *Gunn;* near Hobarton, *Oldfield.*—(Fl. Dec., Jan.)

Distrib. Mountains of New South Wales, Victoria, and New Zealand.

A very small species, forming matted patches.—*Stems* prostrate, much branched; branches 2–5 inches long, often elongate and flexuous. *Leaves* on slender petioles, small, $\frac{1}{4}$–$\frac{3}{4}$ inch long, very variable in form, from elliptical to obovate and rotundate, subacute in the narrower states, blunt or even retuse in the broader. *Flowers* few, axillary. *Perianth* more membranous than in *M. appressa*.

Nat. Ord. LXV. PHYTOLACCEÆ, *Br.*

Of this small Natural Order about eight Australian species are known, belonging to five genera, all peculiar to Australia and Tasmania, and the majority of them to the south and south-west coasts.

Gen. I. DIDYMOTHECA, *Hook. fil.*

Flores dioici, minute bibracteolati. *Perianthium* 4-partitum, laciniis 2 majoribus. Fl. Mas. *Stamina* sub-9, uniserialia; antheris subsessilibus. *Pistilli* rudimenta 0. Fl. Fœm. *Ovarium* didymum, e carpellis 2 orbiculari-reniformibus columnæ brevi adnatis compositum, biloculare; *ovulis* solitariis, ascendentibus, angulo interiore affixis, exostomate fungoso; *stylis* 2, subulatis, divergentibus, facie interna stigmatiferis. *Fructus* didymus, bicapsularis, carpellis compressis dorso longitudinaliter dehiscentibus. *Semina* reniformia, radiatim undulata et transversim striata; testa crustacea, arillo bilobo brevi; albumine centrali carnoso; embryone homotrope curvato peripherico, radicula infera.—Herbæ *v.* suffruticuli *ramosissimi, erecti;* ramis *gracilibus, strictis;* foliis *alternis, linearibus, integerrimis;* floribus *axillaribus, solitariis, axillaribus, breve pedicellatis, subspicatis.*

1. **Didymotheca thesioides** (Nob. in Lond. Journ. Bot. vi. 279); foliis planiusculis, perianthii laciniis late-ovatis, seminibus profunde striato-rugosis.—*Moq. in DC. Prodr.* xiv. 37. (*Gunn*, 380.) (Tab. XCIII.)

Hab. Cataract near Launceston, *Lawrence;* Flinders' Island, *Gunn.*—(Fl. Jan.)

Distrib. South Australia and Swan River.

Of this curious genus only two species are known, the present (which is, I think, the same as Mueller's *D. veronicifornis*), and *D. Drummondii*, Moq., of Swan River.—An erect, dull green, glabrous plant, 1–3 feet high, with a short, woody stem, and many erect, simple, or sparingly divided, slender, angled and furrowed branches. *Leaves* few, alternate, rather fleshy, narrow linear-lanceolate, 1-2 inches long, one-nerved, variable in length and breadth. *Flowers* diœcious, small and green, axillary, becoming spicate towards the tops of the branches, shortly pedicelled; pedicels minutely bibracteolate. *Perianth* four-cleft. *Male flowers* nodding, 2 lines broad, with nine almost sessile, oblong, two-celled anthers, and no pistil. *Female* containing a compressed, didymous, two-celled ovary. *Styles* two, recurved, stigmatiferous along the upper surface, their bases enlarged and lapping over the top of the carpels. *Ovules* solitary in each cell. *Fruit* small, didymous: *carpels* compressed, splitting down the back, coriaceous. *Seeds* solitary, kidney-shaped, with a short, two-lobed arillus, attached by their sinus to the axis of the cell. *Testa* wrinkled; embryo curved round the central fleshy albumen. (Name from διδυμος, *twin*, and θηκα, *a box.*)—Plate XCIII. Fig. 1, male flower; 2, stamen; 3, female flower; 4, vertical section of carpel; 5, ovule; 6, fruit; 7, vertical section of ditto; 8, seed and arillus; 9, the same, with the arillus removed; 10, vertical section of albumen and embryo; 11, embryo removed:—*all magnified.*

Nat. Ord. LXVI. AMARANTHACEÆ.

Between eighty and ninety Australian species of this Order are known, and for the most part described in De Candolle's 'Prodromus,' by M. Moquin-Tandon. By far the greater number of these belong to the genus *Trichinium*, which is confined to Australia (a doubtful South African species excepted), and chiefly to the south-west quarter of the continent. There are also about twenty-five tropical Australian *Amaranthaceæ*, amongst which are some of the most widely diffused Asiatic, and even American kinds. Tasmania contains much fewer species than might have been expected, and no peculiar ones.

Gen. I. TRICHINIUM, *Br.*

Flores hermaphroditi, 3-bracteati. *Perianthium* 5-phyllum, foliolis elongatis erectis plumosis, 2 exterioribus majoribus. *Stamina* 5; filamentis basi in cupulam v. tubum coalitis; antheris sub-2-locularibus. *Ovarium* 1-loculare, 1-ovulatum, stylo elongato; stigmate capitato. *Utriculus* 2-valvis, basi perianthio inclusus. *Semen* verticale, reniforme; testa subcrustacea; albumine centrali farinaceo; embryone peripherico, radicula ascendente.—Herbæ *annuæ v. perennes;* foliis *alternis, rarius oppositis, fasciculatisve;* floribus *capitatis spicatisve, tandem ope perianthii plumosi avolantibus;* bracteis *scariosis, nitidis, persistentibus.*

1. **Trichinium spathulatum** (Br. Prodr. 415); radice perenni lignosa, ramis brevibus ascendentibus glabris viridibus, foliis radicalibus petiolatis obovato-spathulatis obtusis mucronulatis integerrimis glabris, superioribus sessilibus, capitulis solitariis ovatis cylindraceisve obtusis, floribus densis flavidis, perianthio bracteis duplo longiore, foliolis subtrinerviis apice nitidis pilis perianthio longioribus sericeis flavescentibus copiosissimis.—*Moq. Tand. in DC. Prodr.* xii. 288. (*Gunn,* 726.) (Tab. XCIV.)

Hab. Abundant on dry plains near Ross; Clarence Plains, New Norfolk, etc.—(Fl. Nov.) (*v. v.*)

Distrib. Victoria and Swan River.

A very pretty species, belonging to a very large genus, numbering fifty Australian species; it forms a low, herbaceous plant, with a very stout, woody root, and short, prostrate, ascending branches, that bear long, cylindrical heads of silky, yellow flowers.—*Root* often as thick as the thumb. *Branches* 2–4 inches long, spreading from the collum, prostrate, with ascending tips. *Leaves* petiolate, glabrous, spathulate, 1–1½ inch long, blunt, generally with a mucro. *Spikes* 1–2 inches long, ¾ inch broad, blunt, ovate or generally cylindrical. *Bracts* scarious, shining, broadly ovate, half as long as the perianth. *Perianth* linear, five-cleft; segments linear-subulate, unequal, erect, plumose, with long, yellow, silky hairs. *Stamens* five, the filaments united into a small, membranous cup. *Ovary* oblique, pilose at the top, with a long style, and minute, capitate stigma. *Utriculus* with one erect, reniform seed. (Name from τριχινος, *woven;* in allusion to the hairy inflorescence.)—Plate XCIV. Fig. 1, flower; 2, the same, with one segment of perianth removed; 3, apex of pedicel, with stamens and pistil; 4, pistil; 5, stamen; 6, hair of perianth:—*all highly magnified.*

Gen. II. ALTERNANTHERA, *Forst.*

Flores hermaphroditi (rarius polyg. dioici), tribracteati. *Perianthium* 5-partitum, foliolis glabris v. villosis, erectis. *Stamina* 5; filamentis filiformibus, basi in cupulam connatis; staminodiis minutis interjectis; antheris unilocularibus, 2 interdum castratis. *Ovarium* 1-loculare, stylo brevi; stigmatibus 1 v. 2. *Utriculus* obovatus, evalvis. *Semen* verticale, lenticulare; testa crustacea; albumine farinaceo; embryone peripherico; radicula ascendente.—Herbæ; caulibus *ramosis;* ramis *nodosis, angulatis;* foliis *oppositis;* floribus *albis, capitatis, demum deciduis.*

A tropical and subtropical genus, of about twenty-five species, of which three or four only are Australian, and these very variable in habit and foliage. All are herbs, with branched, angular, often jointed and rooting stems, opposite leaves, and capitate, small, white, deciduous, sessile, hermaphrodite flowers. *Perianth* of five subscarious pieces. *Stamens* five, with one-celled anthers and subulate filaments, alternating with minute scales, together united at the base into a cup. *Ovary* one-celled, with one erect ovule, a slender style, and capitate, bilobed or bifid stigma, or two stigmas. *Fruit* a membranous, obovate utricle, with one vertical seed. (Name from the stamens alternating with the staminodia.)

1. **Alternanthera sessilis** (Br. Prodr. 416); glabra v. ramulis ultimis bifariam pubescentibus, caule herbaceo repente ramoso, foliis glabris v. axillis barbatis linearibus lanceolatis obovatis spathulatisve

apice obtusis mucronatisve margine lævi v. denticulato, capitulis sessilibus solitariis binis v. plurimis dense congestis, floribus nitidis albis, perianthio bracteis lateralibus 2–3-plo longiore, sepalis ovatis acuminatis 1-nerviis glabris, staminibus 3 fertilibus, stigmate capitato.—*Moq. Tand. in DC. Prodr.* xiii. 357; *Fl. N. Zeal.* i. 212. A. nodiflora *et* A. denticulata, *Br. Prodr. et Moq. Tand. l. c.* Gomphrena sessilis, *Linn. Sp. Pl.* (*Gunn*, 56.)

Hab. Near Launceston, *Gunn.*—(Fl. March.)

Distrib. Throughout Australia, New Zealand, Polynesia, Asia, and Africa; West Indies (perhaps introduced). (Cultivated in England.)

I have attempted in vain to discriminate between *A. sessilis*, *nodiflora*, and *denticulata*, which are all described as extremely variable plants, and of which *nodiflora* and *denticulata* are said to be scarcely distinct by Moquin-Tandon, in his valuable monograph of the Order, in De Candolle's 'Prodromus.' I find no character in the descriptions of these species whereby they can be recognized. In Australia the plant appears to be even more variable than in any other country, the Tasmanian specimens being very slender, with long, narrow internodes, long, linear or lanceolate leaves, and solitary capitula, whilst some specimens from the continent have short, elliptical-lanceolate leaves, and some, instead of solitary capitula, have very many of these, densely congested into a globose head, an inch in diameter, through which the stem passes. These most dissimilar forms are united by numerous intermediate ones, with short or long, simple or much branched, rigid or flaccid stems, and leaves from ¼ inch to almost 2 inches long. The flowers are always glabrous, white and shining, with ovate, acuminate segments of the perianth, and three fertile anthers alternating with subulate, acute, entire staminodia. The length of the ovary, compared with the cup, formed by the filaments, depends upon age. *Utriculus* compressed, with rather acute margins, and rather uneven faces. *Seed* compressed, black, yellowish, or brown, shining.

Gen. III. HEMICHROA, *Br.*

Flores hermaphroditi, bibracteati. *Perianthium* 5-partitum, intus coloratum. *Stamina* 2–5, filamentis subulatis basi connatis, staminodiis 0. *Ovarium* 1-loculare; stylo brevi; stigmatibus 2, patulis. *Utriculus* perianthio inclusus, compressus. *Semen* verticale, compressum; testa crustacea; albumine farinaceo; embryone hemicyclico, peripherico, radicula ascendente.—Herbæ *v.* suffruticuli; caulibus *prostratis;* ramis *ascendentibus;* foliis *alternis, sessilibus, semiteretibus, exstipulatis;* floribus *solitariis, axillaribus, sessilibus.*

1. **Hemichroa pentandra** (Br. Prodr. 409); glabra, ramis prostratis radicantibus, foliis linearibus acutis, perianthii foliolis ovato-lanceolatis acuminatis bracteis duplo longioribus, staminibus 5.—*Moq. Tand. in DC. Prodr.* xiii. 334. (*Gunn*, 686.)

Hab. On the shore, near high-water mark, Kelvedon, Great Swan Port, *Backhouse;* Georgetown, *Gunn.*—(Fl. Jan.)

Distrib. South coast of Australia, *Brown;* Victoria, *Mueller.*

A small, glabrous, herbaceous, saline plant.—*Stems* 4–6 inches long, prostrate, rooting; roots of very thick, descending fibres. *Branches* 2–3 inches long, descending. *Leaves* alternate, linear, semiterete, spreading, ½–¾ inch long. *Flowers* small, solitary, axillary, sessile. *Perianth* of five erect pieces, coloured internally. *Stamens* five, the filaments forming a cup below, without alternating scales or staminodia. *Ovary* with a short style and two spreading stigmas. (Name from ἡμισυς, *half*, and χροω, *to colour;* in allusion to the coloured inner surface of the perianth.)

Nat. Ord. LXVII. CHENOPODIACEÆ.

This Order is well represented in Australia, though not by those of its tribes which abound most in

various other countries which present similarly extensive areas of desert, salt-marshes, and saline tracts. The majority are however littoral, and many of them shrubs, some common to many other parts of the world, but the greater number are peculiar. About seventy or eighty species are known, of which many are referable to the cosmopolitan genera *Atriplex* and *Chenopodium*, but one large genus, *Rhagodia*, is almost confined to Australia and Tasmania, as are several smaller ones.

Gen. I. RHAGODIA, *Br.*

Flores ebracteati, hermaphroditi, rarius unisexuales. *Perianthium* 5-partitum, laciniis carinato-concavis, fructiferis immutatis. *Stamina* 1–5, imo perianthii inserta; filamentis pubescentibus, subulatis, basi dilatatis; staminodiis 0; antheris latiusculis. *Ovarium* globosum; *stylis* 2–3, filiformibus, intus stigmatiferis. *Acinus* depresso-globosus, basi perianthio cinctus, pericarpio semine adhærente. *Semen* horizontale, depressum; testa crustacea; albumine copioso, centrali, farinaceo; embryone annulari.—Frutices *ramosi;* foliis *alternis v. suboppositis;* floribus *viridibus, solitariis v. glomerulatis;* glomerulis *sæpius in paniculas dispositis;* stylis *exsertis.*

A littoral genus, most common on the south-west quarter of the continent; about twenty species are known. —*Small* shrubs, with alternate, generally entire leaves, often whitish beneath, and with panicled flowering-branches bearing solitary, small, green flowers, or glomerules of these. *Flowers* sessile, generally hermaphrodite. *Perianth* five-parted. *Stamens* five, the filaments pubescent, combined into a cup below, without staminodia. *Ovary* depressed, one-ovuled, with two or three spreading styles. *Fruit* depressed, fleshy, the pericarp adhering to the horizontal seed.—This genus scarcely differs from *Chenopodium*, except in the shrubby habit, pubescent filaments, and fleshy fruit. (Name from ῥαξ, *a berry;* in allusion to the fleshy fruit.)

1. **Rhagodia baccata** (Moq. Tand. in DC. Prodr. xiii. 50); caule fruticoso erecto, ramis sulcatis inermibus, foliis lanceolatis linearibusve integerrimis planis superne glaberrimis subtus albido-pulverulentis, paniculis compositis ramosis ramis divaricatis, floribus sessilibus polygamis.—R. Billardieri, *Br. Prodr.* 408. Chenopodium baccatum, *Lab. Fl. Nov. Holl.* i. 71. *t.* 96. (*Gunn*, 390.)

Var. β. *congesta;* foliis densis, deltoi- v. rhombeo-ovatis.—R. congesta, *Moq. Tand. in DC. Prodr.* xiii. 51. Chenopodium congestum, *Nob. in Lond. Journ. Bot.* vi. 280.

Hab. Common in salt-marshes, etc., especially on the north coasts of the Island. Var. β. Hobarton. —(Fl. Jan.) (*v. v.*)

Distrib. Coasts of extratropical Australia, from Hunter's River to Swan River. (Cultivated in England.)

A very variable shrub, 2–6 feet high, with spreading, furrowed, and angled branches, often striped green or reddish and white. *Leaves* scattered or crowded, very variable in size and form, ½–2 inches long, lanceolate, elliptical-oblong, or subhastate; glabrous above, more or less powdery beneath. *Panicles* branched. *Flowers* very small, clustered.—The *R. congesta* is a broader-leaved state of this plant, which owes much of its peculiar appearance to being young.

2. **Rhagodia nutans** (Br. Prodr. 408); caule herbaceo ramosissimo, ramis gracilibus prostratis diffusis sæpius intricatis inermibus, foliis parvis petiolatis suboppositis hastatis v. oblongo-lanceolatis acutis integerrimis margine recurvis utrinque viridibus, spicis vix paniculatis nutantibus ramis gracillimis laxifloris, floribus sessilibus minimis.—*Moq. Tand. in DC. Prodr.* xiii. 53. (*Gunn*, 727.)

Hab. Abundant in plains near Ross, *Gunn;* and shores of the Derwent.—(Fl. Dec.) (*v. v.*)

Distrib. South-eastern Australia; New South Wales and Victoria. (Cultivated in England.)

Root and base of stem woody. *Branches* numerous, diffuse, prostrate, very slender, often interlaced, a foot or

more long. *Leaves* small, opposite, $\frac{1}{4}$–$\frac{3}{4}$ inch long, petioled, hastate, green on both surfaces. *Flowers* minute diandrous, in small, slender, nodding, simple or branched, terminal panicles.

Gen. II. CHENOPODIUM, *L.*

Flores ebracteati, hermaphroditi v. abortu unisexuales. *Perianthium* 3–5-partitum, fructiferum non auctum. *Stamina* 5 (rarissime pauciora), fundo perianthii inserta; staminodia 0. *Ovarium* depresso-globosum; *stylis* 2–3 interne stigmatiferis. *Utriculus* depressus, perianthio involutus, membranaceus. *Semen* horizontale v. verticale; testa crustacea; albumine centrali farinaceo; embryone peripherico.—Herbæ *plerumque pulvereæ v. glandulosæ;* foliis *alternis;* floribus *in glomerulos dispositis.*

The Australian species of this extensive genus much resemble their European allies, and grow in similar localities; about eight are known, most of which are considered to be peculiar to the continent, but I suspect that some will prove to be varieties of widely diffused plants. The genus differs from *Rhagodia* in being herbaceous, and in having a membranous utriculus, with the seed free. (Name from χην, *a goose*, and πους, *a foot*; in allusion to the form of the leaf of the English "Goose-foot.")

1. **Chenopodium glaucum** (Linn. Sp. Pl. 320); caule herbaceo ramoso prostrato, ramis ascendentibus sulcatis, foliis petiolatis rhombeis v. oblongo- v. lanceolato-rhombeis obtusis sinuatis angulatis repando-dentatisve tenuibus supra glabris subtus farinosis glaucisve, racemis spicatis, perianthio fructifero imperfecte clauso, semine erecto v. horizontali nitido margine obtuso v. acutiusculo.—*Moq. Tand. in DC. Prodr.* xiii. 72; *Fl. N. Zeal.* i. 213.

Var. *ambiguum;* racemis foliaceis, seminis margine obtusiusculo.—C. ambiguum, *Br. Prodr.* 407; *Moq. Tand. l. c.* 67. (*Gunn,* 384, 868.)

Hab. Common on the beach, near high-water mark.—(Fl. Nov.) (*v. v.*)

Distrib. Extratropical interior and coasts of Australia; New Zealand; South Chili; throughout temperate Europe and Asia.

I have several times studied this with other Australian *Chenopodiaceæ*, which so perfectly resemble European species in general appearance, that they can only be separated by characters of slight value, and I have always found myself compelled to merge this, the *C. ambiguum* of Brown, in *C. glaucum*. Moquin-Tandon's excellent characters of the two are almost identical in every point, except in the Australian plant having leafy racemes, and blunter edges to the seed; but I find that the opposite of these characters are not constant in *C. glaucum* (which has often both leafy racemes and blunt edges to the seed), whilst the two plants agree so entirely in habit, foliage, general appearance, and in all other characters, even to that of the variable position of the seed, and number of the segments of the perianth, that I should hesitate before regarding the above differences, even if constant, as of specific value. —The Australian plant is extremely variable in size, from 1–3 feet, and in the stoutness of the branches and size of the leaves, which are $\frac{1}{2}$–2 inches long, and deltoid, ovate, oblong, rhomboid, or various modifications of these forms; their margins are variously sinuate, dentate, or toothed, rarely laciniate. *Racemes* short, in the axils of the leaves, sometimes elongate, an inch long, and leafless. In Australia it is not confined to the sea-coast.

2. **Chenopodium erosum** (Br. Prodr. 407); caule herbaceo suberecto sulcato-angulato ramoso, foliis longe petiolatis patulis triangulari-ovatis v. oblongo-triangularibus subcordatis acuminatis inæqualiter eroso-sinuatis (dentibus obtusiusculis) tenuibus parce pulverulentis utrinque pallide viridibus, racemis breviter paniculatis sublaxis foliatis, perianthio fructifero imperfecte clauso valde carinato, semine margine obtusiusculo rugoso haud nitido.—*Moq. Tand. in DC. Prodr.* xiii. 68.

Hab. Tasmania, *Brown.*

Distrib. South coast of Australia, *Brown.*

I have seen no plant conforming to the above description, which is taken from Moquin's, in De Candolle's 'Prodromus,' where it is further described as an erect, rather rigid herb, with leaves, including the petiole, 2–2½ inches long. The large leaves, subcordate at the base, not farinose below, and opaque, rugose seed, will distinguish this from *C. glaucum*.

Gen. III. ATRIPLEX, *L.*

Flores mono-dioici. Masc. ebracteati. *Perianthium* 3–5-partitum. *Stamina* 3–5, receptaculo inserta. *Pistilli* rudimentum. Fœm. 2-bracteati; bracteis fructiferis erectis dilatatis appressis; *perianthio* 0, vel masculis conformi sed staminibus destituto. *Styli* 2, filiformes, inferne coaliti, intus stigmatiferi. *Utriculus* compressus, bracteis inclusus; pericarpio membranaceo. *Semen* plerumque liberum, verticale; testa coriacea, albumine farinaceo; embryone peripherico.—Herbæ *v.* suffrutices, *plerumque salsæ, sæpissime furfuraceæ;* foliis *alternis;* floribus *confertis, glomerulatis,* glomerulis *spicatis.*

A considerable number of species of *Atriplex* are found on the temperate coasts of Australia, and in the desert interior; about seventeen are known, of which the majority inhabit the south-western quarter. Though many of these are certainly peculiar, some will no doubt prove to be varieties of widely diffused plants; most of them are shrubby, and densely clothed with white, farinaceous scales.—Herbs or shrubs, often saline, with alternate leaves, and minute flowers aggregated into spicate glomerules. *Flowers* unisexual. *Males* bractless, with a three- to five-partite perianth, and as many stamina, and a rudimentary pistil. *Females* with or without a perianth, bibracteate, the bracts enlarging and enclosing the fruit; without stamens. *Ovary* small, with two styles. *Utriculus* membranaceous, with one horizontal seed. (Name from α, privative, and τρεφειν, *to nourish;* in contradistinction to *Chenopodium*, which contains several pot-herbs.)

1. **Atriplex cinerea** (Poiret, Dict. Suppl. i. 471); frutex dioicus cinereo-lepidotus, ramis robustis sulcatis et angulatis, foliis anguste oblongis ovato-oblongisve subdeltoideisve obtusis integerrimis coriaceis in petiolum angustatis, bracteis fructiferis reniformi-rhombeis integerrimis coriaceis disco convexis lævibus. —*Moq. Tand. in DC. Prodr.* xiv. 101; *Fl. N. Zeal.* i. 214. A. Halimus, *Br. Prodr.* 406; *Nees ab Esenb. in Plant. Preiss.* i. 633. (*Gunn*, 395.)

Hab. Abundant upon all the coasts near high-water mark.—(Fl. Sept., Oct.)

Distrib. Extratropical coasts of Australia, New Zealand.

A diœcious shrub, 2–5 feet high, everywhere covered with appressed, white scales. *Branches* stout, grooved. *Leaves* narrow-oblong or ovate-oblong or subdeltoid, quite entire, coriaceous, 1–2 inches long. *Male flowers* densely packed, in terminal, branched spikes; females axillary.—This is distinguished from the European *A. Halimus* chiefly, if not solely, by being diœcious.

2. **Atriplex patula** (Linn. Sp. Pl. 1494); herbacea, erecta, ramosa, glaberrima v. parce furfuracea, foliis petiolatis lineari-ovatis v. subdeltoideo-ovatis lanceolatisve integris sinuato-dentatis lobatisve summis linearibus infimis sæpius hastatis utrinque glabris viridibus, racemis spicisve interruptis, bracteis hastato-rhombeis denticulatis disco lævibus tuberculatisve subcoriaceis.—*Moq. Tand. in DC. Prodr.* xiv. 96; *Engl. Bot. t.* 936; *Fl. N. Zeal.* i. 215. A. Australasica, *Moq. Tand. l. c.* (*Gunn*, 389.)

Hab. Abundant in saline marshes near Launceston, *Gunn.*—(Fl. all Summer.)

Distrib. South coast of Australia; Victoria; New Zealand; throughout Europe, North Africa, and temperate Asia.

An erect, glabrous herb, 2–4 feet high, sometimes covered more or less with furfuraceous scales. *Stems* and *branches* sulcate, striped. *Leaves* petiolate, 1–3 inches long; uppermost linear; lowermost hastate; intermediate a combination of these forms with the ovate or rhomboid, entire or lobed or cut. *Flowers* minute, the glomerules crowded in axillary and terminal peduncles. *Bracts* enclosing the fruit 1–2 lines broad, rhomboid, toothed, with the back of the valves smooth or tubercled.

3. **Atriplex** (**Theleophyton**) **Billardieri** (Nob. in Fl. N. Zeal. i. 215); herbacea, carnosa, papillis crystallinis operta, caule prostrato, ramis ascendentibus, foliis petiolatis ovatis v. oblongis obtusis integris lobatisve, floribus monoicis, masculis glomeratis breve pedicellatis, perianthio 5-lobo, femineis solitariis binisve sessilibus, bracteis fructiferis carinatis urceolatis subbaccatis compressis, semine compresso labiis subacutis integris lobulatisve contrario.—A. crystallina, *Nob. in Lond. Journ. Bot.* vi. 279. Theleophyton Billardieri, *Moq. Tand. in DC. Prodr.* xiii. 115. Obione Billardieri, *Moq. Tand. Enum. Chenop.* 72. (*Gunn*, 875.) (Tab. XCV. *A.*)

Hab. Sands close to high-water mark, Georgetown, *Gunn.*—(Fl. Jan.)

Distrib. Australia, *Labillardière* (*Moq. Tand.*); New Zealand.

A much-branched, slender, glabrous, diffuse, prostrate, succulent herb, with the leaves and branches covered with watery, shining papillæ. *Stems* 8–18 inches long. *Leaves* $\frac{1}{4}$–$\frac{1}{2}$ inch long, shortly petioled, ovate or oblong blunt, entire, or rarely lobed. *Male* flowers clustered, perianth five-lobed. *Females* solitary or few together. *Ovary* contained in an urceolate, two-lipped perianth, formed by the connate bracts. *Fruit* erect, compressed, its edges opposite the lips of the somewhat fleshy perianth.—Plate XCV. *A.* Fig. 1, male flower; 2, the same, with the perianth laid open; 3, female flower; 4, ovary; 5, fruit in perianth; 6, diagram of ditto, showing the position of the seed to the lips of the perianth; 7, ripe fruit; 8, seed; 9, vertical section of seed, showing the embryo — *all magnified.*

Gen. IV. THRELKELDIA, *Br.*

Flores hermaphroditi, ebracteati. *Perianthium* urceolatum, baccatum, superne truncatum, gibbosum, intus pubescens, dentibus 3 membranaceis erectis auctum. *Stamina* 3, hypogyna, inclusa, dentibus opposita. *Styli* 2, setacei, intus apice stigmatiferi, inferne coaliti. *Utriculus* perianthio drupaceo inclusus; pericarpio membranaceo; semine libero; albumine centrali parco; embryone hippocrepico; radicula supera.—Suffruticuli *littorei, erecti v. diffusi;* foliis *alternis, semiteretibus;* floribus *axillaribus, solitariis, sessilibus.*

The only hitherto described species of this genus is a small, diffuse, much and densely branched, glabrous, bushy plant, with slender, prostrate stems, woody at the base, and leafy, short, ascending branches.—*Leaves* lanceolate, acuminate, alternate, semiterete, about $\frac{1}{4}$–$\frac{1}{2}$ inch long, glaucous. *Flowers* minute, axillary, solitary, sessile, hermaphrodite. *Perianth* cylindrical, truncate, gibbous, striated, with three minute membranous teeth at the mouth, and as many hypogynous stamens. *Utriculus* at the base of the hardened perianth, which is fleshy externally, and 1–2 lines long. *Styles* two. *Seed* erect, ovate. (Named in honour of *Dr. Caleb Threlkeld*, author of a 'Synopsis of Irish Plants.')

1. **Threlkeldia diffusa** (Br. Prodr. 410).—*Moq. Tand. in DC. Prodr.* xiii. 127. (*Gunn*, 1232.)

Hab. Sea-shore, on the face of the rocks at the Five-mile Bluff, east of Georgetown, *Gunn.*—(Fl. Jan.)

Distrib. South coast of Australia, *Brown.*

Gen. V. SUÆDA, *Forst.*

Flores hermaphroditi, minute 2-bracteati. *Perianthium* urceolatum, carnosum, 5-partitum, demum inflatum. *Stamina* toro v. fundo perianthii inserta. *Discus hypogynus* annularis v. 0. *Ovarium* ovatum, apice truncatum; stylis 2–5, papillosis. *Utriculus* compressus, calyce clauso inclusus; pericarpio tenuissimo. *Semen* liberum, verticale v. horizontale; testa crustacea; albumine parco v. 0; embryone tereti spirali.—Herbæ *v.* suffruticuli *glabræ v. puberulæ;* foliis *alternis, sessilibus, subteretibus, carnosis;* floribus *axillaribus, sæpius glomeratis;* bracteis *minutissimis.*

The genus *Suæda*, including *Chenopodina*, which differs only in the position of the seed (a character which is not even of specific value in some species of the Order), consists of maritime, succulent herbs or shrubs, some of

which are very widely diffused, and often variable; two are natives of Australia, one a common Indian plant, which is found on the tropical shores, and the other the Tasmanian species, which I have vainly attempted to distinguish from the European *S. maritima*, and which is, I believe, found in all quarters of the globe, under various names.—*S. maritima* is a small, bushy herb, 1–2 feet high, with a woody, erect, or prostrate stem, and herbaceous branches, covered with linear, subcylindrical, sessile, glabrous or farinose leaves, about $\frac{1}{3}$–1 inch long. *Flowers* small, solitary or clustered in the axils of the leaves, green, hermaphrodite, bibracteate. *Perianth* urceolate, five-cleft. *Stamens* five. *Styles* two, united at the base. *Utriculus* membranous. *Seed* very minutely punctate, horizontal or obliquely erect, with a rather acute margin; embryo coiled spirally. (Name from *Suæd*, an Arabic word for a plant yielding Soda.)

1. **Suæda maritima** (Dumort. Flor. Belg. 22); herbacea, basi suffruticosa, ramosissima, foliis subacutis supra planis glabris, floribus 2–3-glomerulatis, perianthio fructifero inflato carinato, semine horizontali v. suberecto margine subacuto punctulato nitido orbiculari v. obliquo et rostellato.—*Fl. N. Zeal.* i. 214. Chenopodina maritima, Australasiæ, *et* tortuosa, *Moq. Tand. in DC. Prodr.* xiii. 161. Chenopodium australe, *Br. Prodr.* 407. (*Gunn*, 391.)

Hab. Abundant on mud and shingle beaches, close to high-water mark.—(Fl. Nov.) (*v. v.*)

Distrib. Extratropical shores of Australia and New Zealand; Europe, Asia, America, and Africa.

When preparing the New Zealand Flora, I compared this plant very closely with the European, and believed it to be entirely the same, and I have now again examined it with the same result. The utriculus, though generally depressed, and containing a horizontal orbicular seed, is occasionally obliquely ascending or suberect, when the seed is also oblique and rostellate at the hilum.

Gen. VI. SALICORNIA, *L.*

Flores hermaphroditi, ebracteati. *Perianthium* carnosum, turbinatum, rhacheos excavationibus immersum. *Stamina* 1–2, fundo perianthii inserta. *Ovarium*, stylis 2, subulatis, basi connatis. *Utriculus* perianthio inclusus. *Semen* erectum v. subhorizontale; albumine carnoso; embryone cyclico.—Herbæ *v.* suffrutices *aphyllæ, salsæ;* caule *erecto v. prostrato;* ramis *articulatis.*

Several species of this curious and widely-spread genus are natives of Australia, including the genera *Arthrocnemum* and *Haliocnemum*, which are so extremely similar, and differ in such minute characters only, that it does not seem natural to separate them generically.—Leafless succulent herbs or small shrubs, growing in salt-marshes, and having woody or herbaceous, erect or prostrate stems, and jointed herbaceous branches; joints generally cylindrical below, and dilated and truncate above. *Flowers* hermaphrodite, very inconspicuous, sunk in the substance of the joints, which are often short, and crowded towards the ends of the branches, forming a sort of cone. *Perianth* ebracteate, urceolate. *Stamens* 1–2. *Ovary* with two styles, which are connate at the base. *Fruit* a membranous utriculus, sunk in the bottom of the perianth, with one erect or vertically depressed seed. (Name from *sal*, salt, and *cornu*, a horn.)

1. **Salicornia Arbuscula** (Br. Prodr. 411); caule subercecto subgracili lignoso ascendente ramosissimo, ramis subligneis, ramulis articulatis herbaceis, articulis elongato-clavatis apice infundibuliformibus, spicis brevibus lateralibus terminalibusque crassis obtusis.—Arthrocnemum Arbuscula, *Moq. Tand. En. Chenop.* 113, *et in DC. Prodr.* xiii. 152.

Hab. Probably common, but I have it only from salt-marshes in the neighbourhood of Hobarton and Clarence Plains.—(Fl. Oct.) (*v. v.*)

Distrib. Tropical and subtropical Australia.

A small rigid shrub, 1–3 feet high, with woody, much branched stems, and short, opposite and alternate jointed branches. *Flowers* monandrous, in the shorter terminal joints, which together form a small spike or strobilus about $\frac{1}{3}$ inch long.

2. **Salicornia Indica** (Willd. Nov. Act. An. Hist. Nat. ii. 111. t. 4. f. 2); caule procumbente subligneso articulato, ramis herbaceis ascendentibus, articulis brevibus elongatisve clavato-cylindraceis compressis obtusis, spicis cylindraceis obtusis, floribus 5–7 diandris.—*Br. Prodr.* 411; *Wight, Ic. t.* 737; *Fl. N. Zeal.* i. 216. Arthrocnemum Indicum, *Moq. Tand. in DC. Prodr.* xiii. 151. (*Gunn*, 392.)

Hab. Abundant in stony places near the sea, and muddy salt-marshes.—(Fl. Nov.) (*v. v.*)

Distrib. All warm and tropical shores of Australia, New Zealand, Asia, and Africa.

A much smaller plant than *S. Arbuscula*, of a very different habit. *Stems* scarcely woody, prostrate, sending up ascending branches 2–6 inches long; joints generally $\frac{1}{3}$–$\frac{1}{2}$ inch long, compressed, but extremely variable in length and breadth. *Spikes of flowers* generally terminal, very variable in size, $\frac{1}{2}$–$1\frac{1}{2}$ inch long, usually not much broader than the branches, but sometimes incrassated.—Moquin considers that Brown's plant is different from the Indian, relying probably on the large size of the strobili of the latter; but this appears a very variable character, and I find such great differences in the size and habit of the species, according to age and locality, that I am inclined to revert to Mr. Brown's opinion (which he still maintains), that the Tasmanian species is the same as Willdenow's and the Indian.

Nat. Ord. LXVIII. LAURINEÆ.

Of this eminently tropical Natural Family there are two sections, differing markedly in habit, and somewhat in distribution. The true *Laurineæ*, which are arborescent or frutescent, are chiefly American; but a large number are Asiatic, and a very few South and North African. About a dozen Australian species are known, chiefly natives of the tropics, a few advancing south to New South Wales, but none being found in South or South-west Australia or Tasmania. The other section consists of the genus *Cassytha*, which in point of habit bears the same relation to *Laurineæ* that *Cuscuta* does to *Convolvulaceæ*, consisting of slender, climbing, leafless, parasitic herbs. Of these there are very numerous Australian species, about twenty being known to me, of which the majority inhabit the South-west quarter of the continent.

Gen. I. CASSYTHA, *L.*

Perianthium 6-fidum, tubo brevi, limbi laciniis 3 exterioribus parvis. *Stamina* 12, duplici serie inserta; seriei interioris 3 laciniis perianthii interioribus opposita sterilia, 3 iis alterna, basi biglandulosa; antheris 2-locularibus. *Fructus* tubo sæpe baccato perianthii apice pervii inclusus.—Herbæ *v.* suffruticuli *aphyllæ, parasiticæ, volubiles*; floribus *glomeratis, spicatis, subsessilibusve*, 3-*bracteatis*; bracteis *parvis, persistentibus.*

Twining, leafless, green or yellowish, slender, often thread-like parasites, natives of all tropical countries, and climbing over shrubs and herbs, to which they adhere parasitically by sessile suckers on their stems and branches. *Flowers* sessile, spiked or capitate. *Perianth* six-cleft. *Stamens* twelve, in two rows; of the six inner three are sterile, and placed opposite the inner pieces of the perianth, and the other three have each two glands at the base of the filaments. *Fruit* enclosed in the baccate perianth, and crowned with its limb. (Name, the Greek one for *Cuscuta*, which this genus strikingly resembles in habit.)

1. **Cassytha melantha** (Br. Prodr. 404); caule robusto glabro, spicis pedunculatis simplicibus brevibus sub-6-floris, floribus late oblongis imbricatis nigro-pubescentibus. (*Gunn*, 533.)

Hab. Abundant near Launceston, growing principally on Acacias.—(Fl. Oct.)

Distrib. Victoria and Swan River.

Much the largest Tasmanian species, sometimes covering and strangling bushes thirty feet high. *Stems*

glabrous, stout, as thick as a stout cord. *Spikes* stout, $\frac{1}{2}$—$\frac{2}{3}$ inch long, with 6–8 sessile, oblong, pubescent flowers. *Fruit* $\frac{1}{3}$ inch long.

2. **Cassytha pubescens** (Br. Prodr. 404); caule pubescente v. laxe tomentoso, spicis subsessilibus v. pedunculatis 3–4-floris, floribus subglobosis glomeratis dense tomentosis. (*Gunn*, 533.)

Hab. Abundant in many parts of the Island.—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales, Victoria, and Swan River.

A less robust species than *C. melantha*, seldom climbing more than 4–6 feet, easily distinguished by its very pubescent stems and inflorescence. *Spikes* somewhat capitate, about three-flowered.

3. **Cassytha glabella** (Br. Prodr. 404); caule gracili glaberrimo, spicis pedunculatis 3–5-floris, floribus parvis glomeratis capitatis glaberrimis globosis. (*Gunn*, 27.)

Hab. Abundant on the North coast of the Island, in sandy soil.—(Fl. Oct.)

Distrib. New South Wales and Victoria.

Quite glabrous. *Stems* about as thick as twine or very stout packthread, forming dense matted masses over bushes 2–3 feet high. *Spikes* capitate, of three to five small globose flowers, terminating a rather slender pedicel $\frac{1}{3}$ inch long. *Fruit* red, narrow pyriform.

Nat. Ord. LXIX. PROTEACEÆ.

The *Proteaceæ* form perhaps the most remarkable feature of the Australian Flora, every species and almost every genus found in that continent and Tasmania being absolutely confined to these countries, as is the case with *Stylidieæ*, which they outnumber many times. Upwards of 650 Australian and Tasmanian species are described in Meisner's excellent and careful revision of the Order (published in De Candolle's 'Prodromus' whilst these sheets were passing through the press), which is more than double the number known to Mr. Brown at the period of the publication of his 'Prodromus.' These belong to 25 genera, all but three (*Persoonia*, *Lomatia*, and *Grevillea*) of which are peculiar to Australia and Tasmania, 8 are confined to South-western Australia, 4 to South-eastern, and 3 to Tasmania. Of the 650 species, upwards of 190 are South-eastern, and 400 South-western, none, I believe, being common to both quarters; there are also between 30 and 40 tropical species, some of those of the north-west coast especially being very singular forms of *Grevillea*, etc. This aggregation of the most peculiar forms of the Australian vegetation in the South-western quarter I have often found occasion to notice, though it is not exhibited in so striking a degree by any other Order, nor perhaps is it paralleled by any similar fact in geographical distribution that the globe presents.

The extra-Australian *Proteaceæ* are for the most part South African, whence nearly 280 have been brought, all belonging to genera differing from the Australian. Upwards of 50 American species are known, the majority tropical; and 18 Asiatic, natives of the Malayan peninsula and islands, Ceylon, and the Eastern Himalaya. A very few Polynesian species have been found, and many no doubt exist in New Caledonia and the neighbouring groups. No species of the Order enters the north temperate zone, except in the warm lower hills and valleys of the Himalaya, and in the island of Japan, which presents so many anomalies in geographical distribution.

Gen. I. CONOSPERMUM *Smith.*

Flores hermaphroditi, spicati, capitati v. paniculati. *Perianthium* tubulosum, deciduum, limbo 4-fido æquali v. sublabiato, lobo postico fornicato. *Stamina* 4, laciniarum basi inserta, inclusa; *filamentis* brevibus, antico ananthero; *antheris* 3, primo cohærentibus, 2 lateralium lobo exteriore abortivo, interiore cum

lobo antheræ perfectæ cohærente et cum eo loculum unicum constituente, demum secedente. *Stylus* filiformis, sursum incrassatus; *stigmate* libero obliquo. *Nux* obconica, 1-sperma, papposa.—Frutices *habita vario*; foliis *sparsis, indivisis, linearibus, filiformibus, integerrimis*; pedunculis *axillaribus*; bracteis *concavis, 1-floris, persistentibus*; floribus *albis cæruleisve, sericeis lanatisve, rarius glabris.*

Rigid shrubs, for the most part natives of South-western Australia, whence twenty-six species are described by Meisner, and there are also about fourteen known South-eastern species: none are tropical.—*Leaves* narrow linear, undivided and entire. *Flowers* white or blue, in terminal heads, spikes, or panicles. *Perianth* tubular, with a generally irregular 4-fid limb, one of whose segments is concave and arched. *Stamens* four, inserted at the base of the segments of the perianth, included; one filament has no anther: of the other three, the lateral have one barren cell next the antherless stamen, and one fertile towards the middle (posticous) perfect stamen, with whose anther-cells they are confluent,—in other words, the middle (posticous) stamen has two fertile lobes which are respectively confluent with, and form one cell with, the adjacent perfect cells of the two lateral anthers. *Nut* obconic, pappose, one-seeded. (Name from *κωνος, a cone,* and *σπερμα, a seed.*)

1. **Conospermum taxifolium** (Smith in Rees' Cycl.); fruticulus sericeo-pubescens, ramis erectis foliosis, foliis anguste linearibus acuminatis 1-costatis, pedunculis elongatis corymbosis tomentosis apice corymboso-polycephalis, floribus sericeis, bracteis ovatis cuspidatis perianthio dimidio brevioribus.—*Br. Prodr.* 368; *Bot. Mag.* 2724. C. taxifolium, β Hookeri, *Meisn. in DC. Prodr.* xiv. 319. (*Gunn*, 625.)

Hab. Abundant in wet heathy places at Spring Bay, on the East coast, *Backhouse, Gunn.*—(Fl. Dec.)

Distrib. New South Wales, Victoria, and South Australia. (Cultivated in England.)

In consequence of my having described young specimens of this plant in the 'Journal of Botany,' in which the leaves were not well developed, and the peduncles had not attained their full length, Meisner has separated the Tasmanian specimens as a variety; they however differ in no respect from Australian ones of *C. taxifolium* of the same age.—A small, erect shrub, with few, slender, erect, pubescent branches, and crowded, linear, ascending, erect, or patent leaves, about an inch long. *Leaves* acuminate, with one nerve, pubescent with silky appressed hairs. *Peduncles* terminal and axillary, together forming a subterminal corymb, densely pubescent, 2–4 inches long, each corymbose at the apex, many-flowered. *Flowers* subcapitate, white, about ¼ inch long. *Bracts* ovate, half as long as the silky perianth, cuspidate.

Gen. II. ISOPOGON, *Br.*

Flores in capitulis strobiliformibus bracteatis congesti, hermaphroditi. *Perianthium* regulare, 4-fidum, gracile, segmentis concavis antheriferis. *Stamina* antheris subsessilibus, apiculatis. *Squamulæ* hypogynæ 0. *Ovarium* 1-loculare, 1-ovulatum; *stylo* filiformi, deciduo; *stigmate* continuo v. medio constricto. *Nux* 1-sperma, sessilis, aptera, undique comosa.—Frutices; foliis *sparsis, rigidis, plerumque laciniatis, summis sæpe capitulum involucrantibus*; floribus *roseis.*

A large genus of Australian plants, of which the majority are natives of the South-west quarter. All have the flowers collected into dense globose or oblong cones, formed of numerous closely-imbricating, deciduous, or persistent bracts.—*Leaves* coriaceous, alternate, generally spreading, very rigid, often laciniate and spinous. *Perianth* regular, 4-fid, with four anthers sessile on its lobes, and no hypogynous scales. *Ovary* with one ovule. *Fruit* a one-seeded nut, covered everywhere with long hairs.—The *I. ceratophyllus* is a small rigid shrub, with numerous, spreading, very rigidly coriaceous, petiolate leaves, that are bi-tri-ternately pinnatifid, with divergent spinulose apices, the upper trifid. (Name from *ισος, equal,* and *πωγων, a beard.*)

1. **Isopogon ceratophyllus** (Br. Prodr. 366); fruticulus glaber, foliis bi-tri-ternatim pinnatifidis segmentis divaricatis planis pungenti-mucronatis aveniis petiolo canaliculato, floralibus basi dilatatis sæpius

trifidis, capitulo terminali globoso, squamis late ovato-oblongis acuminatis inferne sericeo-lanatis, perianthio glabro laciniis apice barbellatis, stigmate tenui subarticulato infra medium puberulo.—*Br. in Linn. Trans.* x. 72; *Meisn. in DC. Prodr.* xiv. 280. (*Gunn*, 898.)

Hab. Islands in Bass' Straits, *Bynoe;* Flinders' Island, *Gunn.*—(Fl. Nov.)

Distrib. Victoria and South Australia. (Cultivated in England.)

Gen. III. AGASTACHYS, *Br.*

Flores spicati. *Perianthium* regulare, tetraphyllum; *foliolis* basi cohærentibus, medio staminiferis. *Filamenta* distincta. *Glandulæ* hypogynæ 0. *Ovarium* sessile, trigonum, 1-loculare, 1-ovulatum; *stylo* elongato, stigmate unilaterali. *Fructus* ignotus.—Frutex *glaberrimus;* foliis *sparsis, integerrimis, planis;* spicis *numerosis;* floribus *alternis, sessilibus,* 1-*bracteatis;* perianthio *flavo, deciduo.*

The only known species is a beautiful bush, 5–9 feet high, turning black in drying, with robust branches, and very numerous, erect, long spikes of white, sweet-scented flowers.—*Branches* glabrous, somewhat angled. *Leaves* 1–2 inches long, erect, extremely coriaceous, glabrous and shining, linear-oblong, blunt or emarginate, shortly petioled, with an obscure midrib. *Spikes* erect, stout, 3–6 inches long, bearing flowers throughout their length. *Bracts* curving outwards, linear, blunt. *Perianth* about ½ inch across, of four linear spreading pieces united at the base. *Stamens* with short filaments inserted on the segments of the perianth, and long linear anthers. *Ovary* three-angled, one-celled, with one ovule. *Fruit* unknown. (Name from αγαστος, *conspicuous*, and σταχυς, *a spike.*)

1. **Agastachys odorata** (Br. Prodr. 371).—*Linn. Trans,* x. 158; *Meisn. in DC. Prodr.* xiv. 328. (*Gunn,* 1236.)

Hab. South and West coasts; Recherche Bay; country South-west of Lake St. Clair, towards Macquarrie Harbour, *Gunn, Milligan, etc.*—(Fl. Jan.) (Introduced into England.)

Gen. IV. CENARRHENES, *Lab.*

Flores spicati. *Perianthium* tetraphyllum, regulare, deciduum, foliolis apice angustatis. *Stamina* basi perianthii inserta. *Glandulæ hypogynæ* 4, staminiformes. *Ovarium* sessile, 1-ovulatum. *Stylus* filiformis, deciduus. *Stigma* simplex. *Drupa* baccata, compressa, putamine osseo.—Arbor *glabra, sicco nigrescens, fœtida;* ramis *angulatis;* foliis *petiolatis, obovato- v. elongato-lanceolatis, obtusis, grosse serratis, coriaceis, nitidis (sicco opacis), penninerviis;* spicis *foliis brevioribus, rachi crassa.*

1. **Cenarrhenes nitida** (Lab. Nov. Holl. i. 36*. t. 50).—*Br. Prodr.* 371; *Linn. Soc. Trans.* x. 158; *Lamk. Illustr. t.* 914. *f.* 1; *Meisn. in DC. Prodr.* xiv. 328. (*Gunn,* 556.)

Hab. Shaded woods, etc.: Recherche Bay and Macquarrie Harbour; also in the mountains of the interior; Hampshire Hills, Arthur's Lakes, Lake St. Clair, etc., *A. Cunningham, Gunn, etc.*—(Fl. Oct.) (Colonial name, "Native Plum.")

A very fine, glabrous, bright-green tree, the only species of the genus, 15 feet high, fetid when bruised, and turning black in drying, very similar when growing to *Anopterus glandulosus* (Gunn).—*Leaves* 3–5 inches long, petioled, lanceolate, coarsely toothed. *Flowers* in short axillary spikes. *Perianth* regular, deciduous, of four leaflets, with the stamens inserted at their base. *Ovary* one-celled, with one ovule and four staminodia at its base. *Fruit* a small Plum-like drupe, uneatable. (Name from κενος, *empty*, and ἀρρην, *masculine;* in allusion to the stamen-like glands.)

Gen. V. PERSOONIA, *Sm.*

Flores sæpissime solitarii, axillares. *Perianthium* deciduum, tetraphyllum v. quadripartitum, regulare; *foliolis* medio staminiferis, demum recurvis. *Stamina* exserta. *Glandulæ* 4, hypogynæ. *Ovarium* pedi-

cellatum, 1-loculare, 1–2-ovulatum; *stylo* filiformi; *stigmate* obtuso. *Drupa* baccata, putamine 1–2-loculari.—Frutices *v.* arbusculæ, *cortice interdum scarioso-lamelloso;* foliis *sparsis, coriaceis, planis acerosisve;* floribus *flavis, axillaribus, breve pedunculatis, plerisque solitariis,* 1-*bracteatis;* fructu *interdum cum stipite suo articulato;* embryone *sæpe* 3–5-*cotyledoneo.*

A large Australian genus, containing upwards of seventy species, of which the majority inhabit the South-eastern quarter of Tasmania, and there is also a New Zealand species.—Shrubs or small much-branched trees, with often scaly bark. *Leaves* alternate, flat, or acerose and pungent, entire, with stomata on both surfaces. *Flowers* axillary, generally solitary, one-bracteate, yellow. *Perianth* regular, of four leaflets, that are patent or recurved. *Stamens* on the middle of the corolla, exserted. *Ovary* pedicelled, with four hypogynous glands, one- or two-celled, with one or two ovules. *Style* slender, with a blunt stigma. *Drupe* with a bony one- or two-celled nut. (Named in honour of *C. H. Persoon,* a botanist of Dutch origin.)

1. **Persoonia juniperina** (Lab. Nov. Holl. i. 35*. t. 45); ramulis patentibus appresse pubescentibus, foliis confertis patulis lineari-subulatis strictis rigidis pungenti-mucronatis sericeo-pubescentibus glabratisve floralibus conformibus, pedicellis subsolitariis perianthiisque pubescentibus, segmentis subattenuatis, ovario stipitato glabro, stylo recto, stigmate subcapitato (*Meisn.*).—*Br. Prodr.* 372; *Linn. Trans.* x. 160; *Meisn. in DC. Prodr.* xiv. 336. (*Gunn,* 1238.)

Var. *β. ulicina* (Meisn. l. c.); ramulis glabrescentibus, foliis semierectis subpollicaribus glabris subtus bisulcis.—*Meisn.* (*Gunn,* 537 *ex parte,* 869.)

Var. *γ. brevifolia* (Meisn. l. c.); foliis patentibus ½-pollicaribus ramulisque densius cano-pubescentibus.—*Meisn.* (*Gunn,* 537 *ex parte.*)

Hab. Very common, ascending to 3200 feet.—(Fl. Feb.) (*v. v.*)

Distrib. South Australia and Victoria. (Cultivated in England.)

Apparently a very variable plant, growing from 1–6 feet high. Gunn distinguishes several varieties, but they do not seem well marked to me. I have adopted those which Meisner, who has examined them all, has made.—*Branches* generally pubescent. *Leaves* ½–1½ inch long, spreading or suberect, rigid, linear-subulate, and pungent, silky or glabrous, usually plane above and semiterete below. *Flowers* solitary or few together, about ½ inch long, on short, stout pedicels. *Perianth* silky.

2. **Persoonia Gunnii** (Nob. in Lond. Journ. Bot. vi. 283); foliis rigidis spathulatis linearibusve planis subenerviis junioribus ramulisque tomentosis, pedicellis crassiusculis perianthioque clavato puberulis, perianthii foliolis acuminatis margine undulatis, pistillo glabro, drupa biloculari.—*Meisn. in DC. Prodr.* xiv. 340.

Var. *α. dilatata;* foliis obovato-spathulatis cuneatis (8–12 lin. longis, 3–4 lin. latis) apice rotundatis retusisve, perianthio glabrato laciniis apice ovali-lanceolatis.—*Meisn. l. c.* (*Gunn,* 870.)

Var. *β. alpina* (Nob. l. c.); foliis lineari-spathulatis (1–1½ poll. longis, 1½–2½ lin. latis) obtusis v. subacutis, perianthio cano-tomentoso laciniis apice anguste lanceolatis.—*Meisn. l. c.* (*Gunn,* 1237.)

Hab. Mountain regions: Lake St. Clair, May-day Plains, and St. Patrick's River, *Gunn, Milligan.*—(Fl. Feb.)

An erect, woody bush, 5–10 feet high, growing in thickets of *Athrotaxis,* etc.—*Branches* robust, pubescent. *Leaves* ⅔–1½ inch long, narrow, linear-spathulate, obtuse or subacute, very thick and coriaceous, nerveless. *Pedicels* stout, axillary, short. *Perianth* yellow, odorous, club-shaped, pubescent. *Drupe* black-purple, glaucous, about ½ inch long.

Gen. VI. BELLENDENA, *Br.*

Flores ad apicem pedunculi elongati nudi racemosi. *Perianthium* tetraphyllum, regulare, patens.

Stamina hypogyna. *Glandulæ* hypogynæ 0. *Ovarium* 1-loculare, 2-ovulatum, cum pedicello articulatum; *stylo* recto demum deflexo; *stigmate* simplici obtuso. *Samara* compressa, obovata, infra apicem stylo reflexo hamata, margine altero subalato, nervulo tenui intramarginali instructa.—Frutex *humilis, glaberrimus;* foliis *sparsis, planis, petiolatis, polymorphis, obovato-cuneatis, rhombeo-cuneatis spathulatis linearibusve, apice trifidis tridentatis v. varie lobulatis, dentibus crenatis;* spicis *terminalibus racemosis;* floribus *sparsis, albis;* perianthio *deciduo.*

1. **Bellendena montana** (Br. in Linn. Trans. x. 166).—*Br. Prodr.* 374; *Meisn. in DC. Prodr.* xiv. 348; *Guillemin, Ic. Pl. Aust. t.* 7. (*Gunn,* 282, 1239.)

Hab. Abundant on the summit of Mount Wellington, Benlomond, Surrey Hills, etc., elev. 3–5000 feet.—(Fl. Jan.) (*v. v.*)

A very pretty little plant, singularly variable in foliage.—*Stems* woody, branched, 3–18 inches high. *Leaves* varying from linear to obovate, spathulate, and cuneate, entire or toothed or lobed at the apex; lobes entire or crenate, $\frac{1}{2}$–$1\frac{1}{2}$ inch long, coriaceous. *Flowers* in terminal dense racemes, at the apex of long, erect, stout, terminal peduncles; pedicels strict, pubescent. *Perianth* white, about $\frac{1}{4}$ inch across, of four regular, equal, spreading, linear leaflets, reflexed after flowering. *Stamens* hypogynous, with linear anthers. *Samara* pendulous, $\frac{1}{2}$ inch long, reddish, very thin, obovate, spathulate. (Named in compliment to *John Bellenden Ker*, an English botanist.)

Gen. VII. GREVILLEA, *Br.*

Flores racemosi. *Perianthium* irregulare, deciduum; laciniis secundis, apice concavis antheriferis. *Antheræ* sessiles. *Glandula* hypogyna solitaria, rarius 0. *Ovarium* plerumque stipitatum, 2-ovulatum; *stylo* elongato; *stigmate* obliquo. *Folliculus* coriaceus v. lignosus; mucronatus v. stylo persistente rostratus, 1–2-valvis, 1–2-spermus. *Semina* aptera v. alata.—Frutices *v.* arbores, *glabræ v. pilosæ, pilis medio affixis;* foliis *alternis, integris pinnatifidisve;* racemis *axillaribus, terminalibus, interdum abbreviatis;* pedicellis *plerisque geminis, bractea decidua suffultis;* floribus *sæpius rubris.*

The paucity of Tasmanian species of this very large genus is remarkable, upwards of 170 Australian species being described by Meisner; most of them are extratropical, about an equal number inhabiting the east and west coasts, and twenty-three being tropical. A few species have been found in New Caledonia. The majority are shrubs, but many form large and handsome trees, with alternate, entire, or often pinnatifid leaves. *Flowers* in racemes or fascicled, axillary or terminal. *Perianth* of four linear leaves, each with a concave apex bearing a sessile anther. *Ovary* one-celled, with two ovules, seated on a disc; style long, with an enlarged, often depressed stigma, *Fruit* a woody two-valved samara. (Named in honour of *C. F. Greville*, an English patron of science.)

1. **Grevillea australis** (Br. 377); frutex ramosissimus proteus, ramulis tomentosis, foliis confertis ($\frac{1}{4}$–$1\frac{1}{2}$-pollicaribus) oblongis lanceolatis subulatisve acutis mucronatisve margine recurvis supra glabratis subtus sericeis, floribus fasciculatis axillaribus, perianthio sericeo, stylo æquilongo, stigmate convexo.—*Br. in Linn. Trans.* x. 171; *Meisn. in DC. Prodr.* xiv. 359.

Var. *α. erecta* (Nob. in Lond. Journ. Bot. vi. 282); erectus, laxe foliosus, foliis ($\frac{1}{2}$–$\frac{2}{3}$-pollicaribus) lanceolatis lineari-subulatisve margine revolutis subtus canaliculatis. (*Gunn,* 730.)

Var. *β. linearifolia* (Nob. l. c.); ramis erectis laxe foliosis, foliis ($\frac{1}{3}$–$\frac{2}{3}$-pollicaribus) anguste linearibus margine revolutis. (*Gunn,* 534 *pro parte.*)

Var. *γ. planifolia* (Nob. l. c.); erectiusculus, foliis confertis obovato- v. lanceolato- v. lineari-oblongis planiusculis v. margine lente recurvis. (*Gunn,* 535.)

Var. *δ. montana* (Nob. l. c.); depressa, dense foliosa, foliis brevibus lineari-lanceolatis. (*Gunn,* 199.)

Var. ϵ. *brevifolia* (Nob. l. c.); depressa, dense foliosa, foliis parvulis ($\frac{1}{4}$–$\frac{1}{2}$-pollicaribus) lineari-subulatis v. obovato-oblongis margine recurvis v. planiusculis. (*Gunn*, 1260.)

Var. ζ. *subulata* (Nob. l. c.); ramis erectis laxe foliosis, foliis ($\frac{1}{4}$–$\frac{1}{2}$-pollicaribus) lineari-subulatis marginibus ad costam revolutis. (*Gunn*, 1240.)

Var. η. *tenuifolia* (Meisn. l. c.); ramulis erectis dense foliosis, foliis pollicaribus filiformi-subulatis acutissimis glabris, perianthii tubo intus inferne barbato. (*Gunn*, 534 *ex parte*.)—G. tenuifolia, *Br. Prodr.* 377; *Linn. Trans.* x. 171.

Hab. Abundant throughout the Colony, ascending to 4000 feet. Var. δ and ϵ, on the mountains only. Var. γ, on the North Esk River.—(Fl. Nov.) (*v. v.*)

Distrib. Alps of Victoria, elev. 6000 feet, *Mueller*.

This is one of the most abundant and variable shrubs in Tasmania. I divided it into seven principal varieties, after a very attentive and laborious study of many hundreds of specimens of Gunn's, Lawrence's, and my own, and find no reason to change them now. I have however followed Meisner in adding an eighth (η. *tenuifolia*), which is hardly different from my β, and which includes Brown's *G. tenuifolia*.—A small shrub, 1–4 feet high, with generally erect branches in low elevations, and depressed or prostrate ones in mountain regions. *Leaves* $\frac{1}{4}$–1$\frac{1}{2}$ long, varying from lanceolate to linear-subulate, from being plane to having the margin so revolute to the midrib that they become terete, and from patent and rigid to erect and rather flexuose; under-surface always silky. *Flowers* in small axillary fascicles. *Perianth* small, about $\frac{1}{6}$ inch long; pedicels short. *Follicle* ovate, smooth, nearly $\frac{1}{2}$ inch long.

2. **Grevillea Stuartii** (Meisn. in Linnæa, xxvi. 357, anno 1853); ramulis gracillimis teretibus subsericeo-tomentellis, foliis herbaceis (sub-2-pollicaribus) linearibus acutis pungenti-mucronatis margine leviter recurvis subtus sericeis, racemis axillaribus folio brevioribus umbelliformibus pedunculo paucifolio sericeo cum pedicellis floribus æquantibus, pistillo perianthium dimidio superante glaberrimo, ovario stipite suo longiore, stigmate terminali obliquo.—G. amplifica, *Muell. MSS.* *An* G. linearis, *var.?* (*Meisn. l. c.*)

Hab. Tasmania, *Stuart*.

I am not acquainted with this species, which, according to Meisner, is extremely nearly related to the New South Wales *G. linearis*; it may be recognized by the linear, acute, herbaceous leaves, 2 inches long.

Note. *G. Seymouriæ* (Sweet), a native of New South Wales, is stated to be a native of Tasmania by Sweet, but upon no sufficient authority. *G. punicea* also, on the authority of a specimen in De Candolle's Herbarium, is stated to be a native of D'Entrecasteaux Channel; it is a New South Wales and Victoria species.

Gen. VIII. HAKEA, *Schrad.*

Perianthium deciduum, irregulare, 4-phyllum, foliis secundis apice concavis antheriferis. *Antheræ* sessiles. *Glandula hypogyna* unica, dimidiata. *Ovarium* stipitatum, 1-loculare, 2-ovulatum; *stylo* filiformi deciduo; *stigmate* plano v. conico. *Folliculus* ligneus, 1-locularis, pseudo-bivalvis, loculo excentrico. *Semina* apice alata.—Frutices arboresve *rigidi, glabri v. pilosi, pilis medio affixis*; foliis *sparsis, interdum in eodem frutice diversissimis*; floribus *fasciculatis subracemosisve, sæpius axillaribus*: gemmis floriferis *squamis scariosis imbricatis involucratis, interdum cum gemma foliifera conseriatis*; pedicellis *geminatim* 1-*bracteatis*; floribus *parvis, albis v. ochroleucis, rarius majusculis rubris.*

Rigid, woody, small trees or shrubs, confined to Australia, whence considerably more than a hundred species have been described; the majority of these inhabit the South-west quarter, but there are many South-eastern, and a few tropical species. The leaves are very various in form, and sometimes vary even on the same species.—*Flowers* fasciculate, or in short racemes, rather small, yellow or whitish, rarely large or red. In most respects the flowers

agree with *Grevillea*, differing chiefly in habit, the deciduous style, and more winged seed. (Named in honour of *Baron Hake*, a German patron of science.)

1. **Hakea Epiglottis** (Lab. Nov. Holl. i. 30. t. 40); glaberrima v. sericeo-puberula, foliis teretibus ascendentibus pungentibus (1–3-pollicaribus) basi attenuatis esulcatis, fasciculis axillaribus sub-4-floris, perianthiis parvis pedicellisque æquilongis albo-sericeis, capsula refracta semilunari glabro lævi apice incurvo acuminato carinato, semine semilunari nucleo oblique obovato ala terminali obovata obtusa breviore.—*Br. Prodr.* 382; *Linn. Trans.* x. 179; *Meisn. in DC. Prodr.* xiv. 395. Hakea Milligani, *Meisn. in Hook. Journ. Bot.* iv. 207, *anno* 1852. (*Gunn*, 729, 1235.)

Hab. Common in various parts of the Island, ascending to 3000 feet.—(Fl. Oct.) (*v. v.*)

Distrib. South-east Australia; Victoria, *Robertson*. (Cultivated in England.)

I have examined the *H. Milligani* in the Linnæan Society's Herbarium, and cannot perceive that it differs from *H. Epiglottis*. A common and very variable species, growing from 5–10 feet high, wholly glabrous or sparingly covered with appressed silky hairs.—*Leaves* 1–3 inches long, usually curving upward, quite terete, rigid and pungent, rarely erect and rather flexuose, sometimes rigidly patent, neither grooved nor striate. *Flowers* in small axillary fascicles, four to six together; pedicels and perianth with white or rufous silky hairs. *Capsules* woody, somewhat like a letter S in shape, being suddenly bent down, with the point acuminate, as suddenly turned in, very woody, somewhat compressed, $\frac{1}{2}$–$\frac{2}{3}$ inch long, grey or reddish; back quite smooth or roughish. *Seed* black, nucleus shorter than the wing.

2. **Hakea pugioniformis** (Cav. Ann. Hist. Nat. i. 213; Ic. vi. p. 24. t. 533); foliis patentibus ascendentibusve teretibus acuminato-pungentibus (1–2-pollicaribus) exsulcis basi attenuatis ramulisque glabris v. appresse minute sericeis, fasciculis axillaribus racemosis sericeis villosisve sub-8-floris, capsula recta ovato-lanceolata in rostrum rectum pugioniforme sensim attenuata infra medium transverse echinato-cristata, seminis nucleo obovato tuberculato ala terminali æquilata dimidio breviore.—*Br. Prodr.* 381; *Linn. Trans.* x. 178; *Cav. Ic.* 533; *Lodd. Bot. Cab.* 353; *Reichenb. Mag. t.* 23; *Meisn. in DC. Prodr.* xiv. 398. (*Gunn*, 731.)

Var. *a. sericea*; racemo sericeo.—*Meisn. l. c.*

Var. *β. hirsuta*; racemo villoso.—*Meisn. l. c.*

Hab. Common in many parts of the Island, in poor soil; Yorktown, Flinders' Island, Georgetown, Hobarton, etc.—(Fl. Jan.) (*v. v.*)

Distrib. South-eastern Australia; New South Wales and Victoria. (Cultivated in England.)

A small, sparingly branched shrub, 2–4 feet high, a good deal similar in foliage to *H. Epiglottis*, but the leaves are shorter and more strict.—*Flowers* more numerous, racemose, and densely silky or villous, and the fruit straight, conical, and swollen below, gradually tapering into a rigid, pungent apex; it is transversely crested about the broadest part, and contains one black seed, with a short ridge or prominence in the nucleus, and a flat blunt wing.

3. **Hakea microcarpa** (Br. Prodr. 383); foliis (1–3-pollicaribus) linearibus teretibus passim planis attenuato-pungentibus ramulisque glabris infimis v. plantis junioribus omnibus planis marginibus incrassatis, pedicellis perianthiisque æquilongis glaberrimis, capsula $\frac{1}{3}$–$\frac{1}{2}$-pollicari oblonga obtusa v. acuta compressa basi attenuata, calcaribus brevissimis deciduis, seminis nucleo lævi margine basique aptero ala terminali nucleo latiore et longiore.—*Br. in Linn. Trans.* x. 182; *Lodd. Bot. Cab. t.* 219; *Bot. Reg.* 475; *Meisn. in DC. Prodr.* xiv. 400.

Var. *a. Tasmanica* (Meisn. l. c.); pedicellis fructiferis tenuibus, capsula minore brevi sub-$\frac{1}{8}$ unc. longa atrofusca, valvis coriaceis. (*Gunn*, 20, 210.)

Var. *β. Bathurstiana* (Meisn. l. c.); pedicellis fructiferis incrassatis, capsula majore oblonga sub-$\frac{1}{2}$ unc. longa pallidiore, valvis lignosis. (*Gunn*, 2001.)

Hab. Common, especially on gravelly banks of rivers, ascending to 3000 feet. Var. β. Flinders' Island, *Gunn.*—(Fl. Nov.) (*v. v.*)

Distrib. Var. β. New South Wales and Victoria. (Cultivated in England.)

A shrub, 2–5 feet high. *Leaves* of the young plants flat, very narrow, linear, acuminate and pungent, 1–4 inches long, with thick margins; of the old plants terete and pungent. *Capsule* small, of two coriaceous oblong valves, each with a deciduous spur on the back. In var. β the capsules are larger and more woody.

4. **Hakea acicularis** (Br. Prodr. 383); arborea, foliis erectis patulisve 1–1½-pollicaribus teretibus acuminato-pungentibus basin versus subtus sulcatis sessilibus basi non attenuatis ramulisque glabris, fasciculis 3–5-floris, pedicellis gracilibus sericeis perianthiisque glaberrimis, capsula crassa ovata rugoso-tuberculata superne gibba apice compressa recta v. breviter hamata et obscure bicalcarata, seminis nucleo tuberculato alato, ala nucleo duplo longiore secus latus inferius seminis producta.—*Br. in Linn. Trans.* x. 181; *Reichenbach, Mag. t.* 24; *Endl. Icon. t.* 24; *Meisn. in DC. Prodr.* xiv. 401. Conchidium aciculare, *Vent. Malm. t.* 111. (*Gunn,* 2000.)

Hab. Cape Barren and Flinders' Island, in Bass' Straits, *Milligan, Gunn.*—(Fl. Oct.)

Distrib. New South Wales and Victoria. (Cultivated in England.)

A small bushy tree. Branches and leaves glabrous. *Leaves* patent or erect, about 1 inch long, terete, pungent, sessile by a broad, slightly decurrent base, obscurely grooved below near the base. *Flowers* glabrous, on slender silky pedicels. *Fruit* rather large, nearly an inch long, very thick, rough, with shallow hollows and blunt ridges, blunt, or with a slightly incurved point. *Seed* with a tubercled nucleus; wing on one side produced into a broad terminal expansion.

5. **Hakea lissosperma** (Br. Prodr. 382); subarborea, foliis junioribus ramulisque incano-sericeis, foliis (2–4-pollicaribus) teretibus paulo incurvis pungenti-acuminatis basi attenuatis exsulcis glabris, pedicellis sericeis perianthio glaberrimo brevioribus æquilongisve, capsula majuscula ventricoso-ovata gibbosa obtusa subrugosa rimosa brevissime bicalcarata, valvis crasse lignosis, seminis ala obovata obtusa hinc secus nucleum lævem decurrente.—*Br. in Linn. Trans.* x. 180; *Meisn. in DC. Prodr.* xiv. 401. (*Gunn,* 536.)

Hab. Subalpine situations, common, 2–4000 feet.—(Fl. Nov.) (*v. v.*)

This fine species is confined to Tasmania, and is the largest of all, attaining a height of 12 feet; it is also the longest-leaved, and has the largest capsules.—*Leaves* 2–4 inches long, terete, subflexuous, pungent, narrowed at the base. *Capsule* ¾–1 inch long, very thick and woody; the valves oblong, gibbous, subacute, rough on the back, obtusely spurred towards the apex. *Seeds* with a smooth black nucleus, and a wing of about the same length as the nucleus, and produced down one of its sides.

Gen. IX. ORITES, *Br.*

Flores spicati. *Perianthium* tetraphyllum, regulare, foliolis apice recurvis. *Stamina* supra medium foliolorum inserta; *antheris* subsessilibus. *Glandulæ hypogynæ* 4, liberæ, breves. *Ovarium* sessile, 1-loculare, 2-ovulatum; *stylo* filiformi, stricto; *stigmate* verticali, obtuso. *Folliculus* coriaceus, loculo subcentrali 2-spermo. *Semina* erecta, apice vel utrinque alata.—Frutices; foliis *alternis, integerrimis dentatisve;* spicis *brevibus, axillaribus terminalibusve;* floribus *geminis, per paria* 1-*bracteatis.*

A small genus of mountain plants, consisting of six species, of which one is found on the mountains of New South Wales, and the others on those of South-eastern Australia and Tasmania; all but the New South Wales species form low bushes, with alternate, flat or terete leaves, and terminal or axillary spikes. *Flowers* geminate, with one bract at the base of each pair. *Perianth* of four linear leaflets, with recurved apices, which bear sessile

anthers. *Ovary* with four hypogynous glands, one cell, two ovules, and a straight style. *Fruit* a follicle, with two erect seeds, which are winged at the top, or both at the top and base. (Name from ορος, *a mountain*.)

1. **Orites diversifolia** (Br. Prodr. 388); frutex rigidus erectus, ramulis tomentosis, foliis breve petiolatis lanceolatis acuminatis integerrimis v. apice v. supra medium grosse dentatis venis obscuris subtus pubescentibus glabratisve, spicis axillaribus terminalibusque foliis brevioribus puberulis, floribus sessilibus glaberrimis.—*Br. in Linn. Trans.* x. 190; *Meisn. in DC. Prodr.* xiv. 424. (*Gunn*, 738.)

Hab. Near the summit of Mount Wellington; rare.—(Fl. Jan.) (*v. v.*)

This is one of the few Tasmanian alpine plants that has hitherto been found in one confined locality only. It forms a small, erect, rigid shrub, with stout, pubescent or almost tomentose branches, and rigid, erect, lanceolate leaves, 2–3 inches long, which are glabrous on both surfaces, or pubescent below, and entire or toothed at the apex, or coarsely serrate from above the middle upwards. *Flowers* small, glabrous, spiked, the spikes axillary and terminal, strict, erect, shorter than the leaves.

2. **Orites Milligani** (Meisn. in Hook. Bot. Journ. iv. 209, ann. 1852); frutex rigidus glaber, ramulis brevibus crassis, foliis breve petiolatis ovalibus ovato-rotundatisve grosse dentatis crasse coriaceis, spicis solitariis terminalibus erectis densifloris foliis longioribus, pedunculo floribusque sessilibus glaberrimis, ovario dense sericeo, bracteis ovatis acuminatis, capsula compressa ovata rostrata.—*Meisn. in DC. Prodr.* xiv. 424. (*Gunn*, 2052.)

Hab. Mount Sorrell, Macquarrie Harbour, elev. 4–5000 feet, *Milligan.*—(Fl. Dec.)

A very remarkable and distinct species, forming a small, rigid, very woody bush, 1–3 feet high, with stout branches and glabrous branchlets.—*Leaves* very thick and coriaceous, about $\frac{2}{3}$–1 inch long, petiolate, oblong or rounded, coarsely toothed. *Spikes* 2–3 inches long; young ones densely clothed with imbricating, concave, rigid, ovate, acuminate bracts; older elongated; peduncle glabrous. *Flowers* sessile, glabrous. *Capsule* about $1\frac{1}{2}$ inch long.

3. **Orites revoluta** (Br. Prodr. 388); frutex, ramis ascendentibus, ramulis sericeo-tomentosis, foliis lineari-teretibus muticis integerrimis margine ad costam revolutis subtus incano-tomentosis, spicis axillaribus terminalibusque foliis longioribus, pedunculo ovarioque dense lanuginoso, perianthiis glabris, bracteis sericeis, capsula elliptica utrinque angustata compressa dense sericeo-tomentosa.—*Br. in Linn. Trans.* x. 190; *A. Rich. Sert. Astrol.* 70. *t.* 25. *f.* 1; *Meisn. in DC. Prodr.* xiv. 424. (*Gunn*, 286.)

Hab. On all the mountain-ranges above 3000 feet elevation, abundant.—(Fl. Feb.) (*v. v.*)

A shrub, 4–6 feet high, with ascending or suberect, tomentose branches. *Leaves* less than 1 inch long, suberect, very thick and coriaceous, linear and terete, from the margins being rolled back to the midrib, tomentose beneath. *Spikes* twice as long as the leaves, terminal and lateral, rigid, erect, lanuginose with brown tomentum, as are the ovaries. *Perianth* glabrous. *Capsules* about as long as the leaves, densely pubescent, obliquely elliptical, acuminate.

4. **Orites acicularis** (Br. Prodr. Suppl. 32); frutex nitidus erectus, foliis petiolatis erectis teretibus pungenti-acuminatis superne sulcatis, spicis axillaribus terminalibusque foliis brevioribus, rachi flexuosa ovarioque sericeo-pubescentibus, bracteis perianthiisque glabris, capsula glabra compressa obovato-elliptica abrupte incurvo-rostrata, semine utrinque alato.—*Br. in Linn. Trans.* x. 224; *Meisn. in DC. Prodr.* xiv. 424. (*Gunn*, 265.)

Hab. Abundant on all the mountains, especially by streams, elev. 3–4000 feet.—(Fl. Dec.) (*v. v.*)

An erect bush, 4–5 feet high, of a singularly pale yellowish hue, and so common along the banks of alpine streams that Gunn says their course may be traced from a distance by it.—*Leaves* 1 inch long, erect, terete, glabrous, petioled, pungent. *Spikes* short, silky, axillary and terminal, flexuose. *Flowers* small. *Bracts* broadly ovate, with long, acuminate points, glabrous. *Follicle* compressed, glabrous, with suddenly upturned, acuminate beaks.

Gen. X. TELOPEA, *Br.*

Flores dense corymbosi, involucrati. *Perianthium* irregulare, hinc longitudinaliter fissum, unilabiatum, labio 4-fido lobis concavis antheriferis. *Antheræ* sessiles. *Glandula hypogyna* subannularis. *Ovarium* stipitatum, multi-ovulatum; stylo filiformi, persistente; stigmate obliquo, convexo, clavato. *Folliculus* cylindraceus, 1-locularis, pellicula seminibus interposita. *Semina* apice alata, truncata v. rotundata, hinc immarginata, raphe bicruri.—Frutices; ramis *subverticillatis;* foliis *sparsis, coriaceis, penninerviis, integerrimis dentatisve;* racemis *terminalibus;* floribus *geminatis, per paria unibracteatis, coccineis.*

The only two known species are very conspicuous and singularly beautiful plants, known as Warratau, one inhabits the mountains near Port Jackson, and the other those of Tasmania. The Tasmanian *T. truncata* is a shrub, 6–10 feet high, with robust, pubescent branches. *Leaves* very coriaceous, spreading, narrow, linear-obovate or obovate-lanceolate, acute or obtuse, pubescent beneath, narrowed into a short petiole, 2–3 inches long. *Heads* of blossoms 2–3 inches across, crimson, loaded with honey. *Flowers* densely corymbose, with numerous imbricating, acuminate, silky bracts at the base of the peduncles. *Perianth* about 1 inch long, irregular, one-lipped, lip quadrifid. *Capsule* woody, 1½ inch long, linear-obovate, curved, terete, minutely pubescent, terminated with the persistent, woody style. *Seeds* numerous, winged. (Name from τηλωπος, *seen at a distance;* from their conspicuous inflorescence.)

1. **Telopea truncata** (Br. Prodr. 388); ramulis pubescentibus, foliis anguste lineari-obovatis obovato-lanceolatisve subacutis integerrimis v. rarius paucidentatis subtus pubescentibus demum glabratis, corymbo depresso, bracteis brevibus acuminatis.—*Meisner in DC. Prodr.* xiv. 446. Embothrium truncatum, *Lab. Nov. Holl.* i. 32. (*Gunn,* 175.)

Hab. Abundant in cool, humid, mountainous regions, elev. 2–4000 feet.—(Fl. Dec., Jan.) (*v. v.*) (Colonial name, "Warratau.")

Gen. XI. LOMATIA, *Br.*

Flores racemosi. *Perianthium* 4-phyllum, unilabiatum, irregulare, foliolis distinctis secundis. *Antheræ* subsessiles. *Glandulæ* hypogynæ 3, secundæ. *Ovarium* stipitatum, multi-ovulatum; *stylo* persistente, filiformi; *stigmate* obliquo, dilatato, planiusculo. *Folliculus* ovali-oblongus, teres v. compressus, bivalvis, polyspermus, pellicula seminibus interposita. *Semina* apice v. utrinque alata; raphe marginali, alam cingente.—Frutices *v.* arbusculæ; foliis *alternis, plerisque pinnatim laciniatis, interdum in eodem frutice variis;* racemis *terminalibus axillaribusque;* floribus *ochroleucis, geminis, pedicellis per paria unibracteatis;* seminis *nucleo farina sulphurea consperso.*

A small genus of about seven species, confined to South-eastern Australia, Tasmania, and south temperate America.—Small or large shrubs or small trees, with alternate leaves, varying extremely in form, being sometimes simple and entire and laciniated or pinnatifid on the same plant. *Flowers* racemose. *Perianth* of four leaflets, all turned in one direction, with concave tips, each bearing a sessile anther. *Ovary* stalked, with three hypogynous glands on one side, a straight style, and an oblique, flat, dilated stigma, many-ovuled. *Follicle* with many winged seeds. (Name from λωμα, *a border;* in allusion to the winged seeds.)

1. **Lomatia polymorpha** (Br. Prodr. 389); frutex, ramulis pubescenti-tomentosis, foliis proteis lineari-lanceolatis obtusis acutisve integerrimis dentatisve ovato-lanceolatisve sinuato-lobatis pinnatifidisve junioribus utrinque senioribus subtus *rufo-* v. griseo-tomentosis demum glabratis, racemis brevibus terminalibus tomentosis, pedicellis perianthium subæquantibus.—*Br. Linn. Trans.* x. 200; *Meisner in DC. Prodr.* xiv. 448. Embothrium tinctorium, *Lab. Fl. Nov. Holl.* i. 31. *t.* 42. (*Gunn,* 1241.)

Hab. Abundant in the western and southern and subalpine central districts; Recherche Bay, Lake St. Clair to Macquarrie Harbour, Mount Wellington, etc. (Fl. Jan.) (*v. v.*)

Distrib. South-eastern Australia, Victoria, *Mueller*.

A tall, slender shrub, 4–8 feet high, with pubescent branches. *Leaves* very variable, 1–3 inches long, linear-lanceolate, blunt or sharp, entire or toothed or pinnatifid, above glabrous, nerveless; below covered with brown or ashy-grey appressed down; margins recurved, midrib strong. *Racemes* about as long as the leaves, $1\frac{1}{2}$ inch broad, short, blunt; peduncles, pedicels, and flowers covered with somewhat silky pubescence. *Perianth* about as long as the pedicel, $\frac{1}{3}$ inch. *Follicle* linear-oblong, gibbous, narrowed at both ends, glabrous.—I have not kept up Meisner's varieties, *α, cinerea*, and *β, rufa*, as both occur on the same plant.

2. **Lomatia tinctoria** (Br. Prodr. 389); fruticulus erectus, foliis pinnatifidis bipinnatifidisve rarius integris glaberrimis v. subtus ramulisque puberulis laciniis linearibus 1-nerviis obtusis acutis acuminatisve, racemo terminali elongato, pedunculo gracili, pedicellis glabris v. puberulis perianthio longioribus.—*Br. in Linn. Trans.* x. 199; *Meisner in DC. Prodr.* xiv. 448; *Hook. Bot. Mag. t.* 4110. Embothrium tinctorium, *Lab. Nov. Holl.* i. 31. *t.* 43. (*Gunn*, 1, 1242.)

Hab. Abundant in poor sandy soil, ascending to 3000 feet.—(Fl. Dec.) (*v. v.*) (Cultivated in England.)

A much smaller species than *L. polymorpha*, rarely exceeding 2 feet high, growing gregariously, and increasing by subterranean runners, whence the plants form great patches. *Leaves* glabrous, pinnatifid or bipinnatifidly cut into narrow-linear, blunt, acute or acuminate segments. *Peduncles* of the spikes much elongated. *Pedicels* slender. *Perianth* cream-coloured, sweet, but rather heavy-smelling, smaller than that of *L. ferruginea*.

Gen. XI. BANKSIA, *Linn. fil.*

Flores amentacei. *Perianthium* 4-partitum, rarius 4-fidum, rectum v. incurvum, foliolis diu cohærentibus apicibus concavis antheriferis. *Antheræ* subsessiles. *Squamulæ* hypogynæ 4. *Ovarium* spurie 2-loculare; *ovulis* 2, collateralibus dorso connatis; *stylo* filiformi v. subulato, deciduo, exserto; *stigmate* dilatato. *Folliculus* lignosus, amenti rachi semi-immersus, ovalis, compressus, bivalvis, 2-locularis, septo e seminum testis connatis formato libero ligneo bifido. *Semina* nigra, apice alata, nucleo lacuna septi semi-immerso.—Arbores *v.* frutices *plerumque rigidi;* ramis *umbellatis;* foliis *sparsis, rarius verticillatis, integris, serratis, pinnatifidisve;* amentis *rarius lateralibus, solitariis, cylindricis, rarius abbreviatis, basi interdum bracteatis;* floribus *geminis, per paria* 3-*bracteolatis;* bracteola *exteriore majore, interioribus collateralibus;* amenti *fructiferi rachi lignosa;* folliculis *plerumque in quovis amento paucis, horizontalibus.*

A noble genus, no less remarkable for its handsome inflorescence than for the number of its species, which amount to nearly sixty. The majority of these are natives of the south-eastern coasts of Australia, very few comparatively being south-western, and still fewer tropical. The majority form bushes, rarely rising to small trees, and most have rigid, woody branches, often covered with very rough bark, and very coriaceous, hard, lurid-green or grey-green leaves, often pubescent or cinereous beneath.—*Flowers* densely compacted in terminal, broad, cylindrical, erect catkins, often resembling bottle-brushes; when these are taken to pieces the flowers are found to be sessile, and aggregated in pairs, each pair having three bractlets at its base, one outer, and two collateral within it. *Perianth* green, yellow, or red, tubular, four-parted, often incurved; the leaflets concave at their tips, and there each bearing a sessile anther. *Ovary* with four hypogynous glands, a straight, exserted style, one cell, and two erect ovules attached together. *Fruit*, few ripening in each catkin, each forming a woody, compressed, transversely elongated, horizontal, two-valved follicle, consolidated with the woody axis of the catkin. *Cell* divided by a spurious dissepiment formed by the testa of the seeds, which are adherent by their opposed faces; this septum afterwards

becomes free, and presents a hollow on either face, in which the nucleus of the seeds lie. (Named in honour of *Sir Joseph Banks*, the eminent botanist and companion of Captain Cook, during his first voyage.)

1. **Banksia media** (Br. Prodr. Suppl. 35); arborea, ramulis cano-tomentosis, foliis petiolatis anguste lineari-oblongis basi attenuato-cuneatis obtusis truncatisve grosse dentatis glabris v. costa subtus tomentosa margine planis nervis subtus parallelis divaricatis pagina inferiore impresso-punctulata, spica cylindrica, perianthio sericeo.—*Bot. Mag. t.* 3120; *Meisn. in DC. Prodr.* xiv. 458. (*Gunn*, 871.)

Hab. On two hills, called the Sisters, between Rocky and Table Capes, on the North coast, *Backhouse, Gunn.*—(Fl. Jan.)

Distrib. South coast of Australia, between Lucky Bay and Cape Arid. (Cultivated in England.)

This remarkably handsome plant appears to be restricted to one locality in Tasmania. I have compared it with both native and cultivated Australian specimens, which are identical with the Tasmanian.—A tree 20 feet high, with naked trunk and branches, bearing tufts of leaves at their extremities only. *Branchlets* densely tomentose. *Leaves* very coriaceous, flat, 4–5 inches long, $\frac{3}{4}$ inch broad, gradually tapering from below the middle into the tomentose footstalk, blunt, truncated at the apex, coarsely serrated; margins flat; upper surface glabrous, shining; under paler, glabrous or pubescent on the costa, covered with impressed dots, which are lacunæ between the ultimate ramifications of the nerves; main nerves horizontal and parallel, one to each tooth. *Cone* generally longer than the leaves, 4–7 inches, cylindrical, blunt, twice as long as broad, young densely covered with brown tomentum. *Perianth-lobes* with a small, silky lamina, and long, wiry claw. *Stigma* small.

2. **Banksia Australis** (Br. Prodr. 393); arborea v. fruticosa, ramulis incanis plantis junioribus ferrugineo-tomentosis, foliis (1–2-pollicaribus) linearibus lanceolatis v. cuneato-lanceolatis plantis junioribus grosse serratis senioribus minoribus angustioribus apice obtusis retuso-truncatisve, marginibus recurvis, supra convexis medio sulcatis subtus niveis reticulatis costa valida, spica oblonga brevi v. elongata, perianthio sericeo.—*Bot. Reg.* 787.

Var. *α*; arborea, foliis plantis senioribus linearibus obtusis truncatisve subintegerrimis.—B. Australis, *Br. l. c.* B. Australis *et* B. Gunnii, *Meisn. l. c.* (*Gunn*, 728, 1233.)

Var. *β. depressa*; caule prostrato, foliis cuneato-lanceolatis integris v. spinuloso-dentatis.—B. depressa, *Br. Prodr.* 393; *Linn. Trans.* x. 205; *Meisn. in DC. Prodr.* xiv. 456. B. depressa, *β*, subintegra, *Meisn. in Hook. Bot. Journ.* iv. 210, *anno* 1852. B. patula, *Brown et Meisn. l. c.* (*Gunn*, 1234, 2002.)

Hab. Abundant throughout the Island, ascending to 3000 feet.—(Fl. Nov.) Col. name, "Honeysuckle tree."

Distrib. South-eastern Australia; Victoria, *Mueller.* (Cultivated in England.)

I have no hesitation in reducing *B. depressa*, Br., *B. Gunnii*, Meisn., and *B. patula*, Br. (as far at least as the Tasmanian specimens of it are concerned), to *B. Australis*, having seen all these forms growing, and having Gunn's testimony to the impossibility of distinguishing them. The normal state of the species is a bush 10–14 feet high, but it sometimes becomes arborescent, and at others dwarf. The characters in the foliage, whence specific diagnoses have been drawn, may all be found on one individual and at one period of growth, though there is always a marked difference between young and old plants, the former always bearing larger coarsely-toothed leaves, and the older generally having more entire, and sometimes narrow-linear leaves. The branches are most tomentose, and often densely so, in young plants.—*Leaves* patent or erect, 1–3 inches long, narrow-lanceolate or narrow-obovate, cuneate, usually truncate and retuse at the apex, with the nerve produced into a short mucro; margins recurved; upper surface smooth, shining, under snow-white, reticulated, with a stout reddish costa. *Spikes* very variable in size, 1–4 inches long, almost globose or oblong-cylindrical, pale yellow or greenish. *Perianth* small, silky, the laciniæ often glabrous on the back, or silky down the middle.

Nat. Ord. LXX. THYMELEÆ.

In its profusion of peculiar *Thymeleæ* extratropical Australia presents a parallel to Southern Africa, though in that country there are even a greater number of species, and they belong to many more genera. In Australia all fall under *Pimelea* itself, with the exception of a very few species of the tropical or sub-tropical genus *Wikstræmia*, a single one of *Macrostegia* (a genus closely allied to *Pimelea*), and one of *Drapetes*.

Gen. I. DRAPETES, *Lam.*

Perianthium tubulosum, limbo 4-fido, tubo supra basin articulato v. inarticulato, fauce squamata v. esquamata. *Stamina* 4, fauce inserta. *Stylus* lateralis; stigmate capitato v. plumoso. *Nux* ecorticata.—Fruticuli *sericei, muscoidei v. ericoidei;* foliis *linearibus, imbricatis;* floribus *solitariis paucisve, terminalibus, inconspicuis.*

A small and extremely natural genus, consisting of five species remarkably distributed, one being found in Fuegia, a second on the lofty mountain of Kini Balu in Borneo, two on the mountains of New Zealand, and one in Tasmania. All are small, more or less silky, herb-like shrubs, with prostrate, creeping, tufted stems, and slender branches covered with imbricating, linear, entire leaves. *Flowers* small, terminal, sunk amongst the leaves. *Perianth* tubular, with four spreading lobes, the tube continuous or jointed near the base, four stamens at the throat, alternating with four scales in some species, and eight glands in others. *Ovary* with a lateral style.—The genus has been divided into two, from the presence or absence of the scales on the perianth, the continuous or jointed tube, which is angled or terete, and the plumose or capitate stigma; but if these characters are all adopted, the genus must be broken up into several. Of these genera *Drapetes* has no glands on the perianth, and *Kelleria*, Endl., to which the Tasmanian and New Zealand species belong, has glands and a non-articulate perianth.—The *D. Tasmanica* is a densely-tufted, prostrate plant, forming large matted cushions on the mountains, with slender interlaced stems 4–8 inches long, and slender branches, covered with imbricating, erect, linear leaves. *Leaves* 1–1½ line long, concave, obtuse, silky at the back. *Perianth* terminal, silky, sessile, subinfundibuliform, rather longer than the leaves; tube obscurely angled, not jointed; lobes as long as the tube, linear. *Stamens* exserted. *Glands* eight, spherical, in pairs between the stamens. *Style* curved, included; stigma capitate. *Nut* black, shining. (Name, δραπετης, *a runaway;* in allusion to the fugacious perianth.)

1. **Drapetes Tasmanica** (Nob. in Kew Journ. Bot. v. p. 299. t. vii. anno 1853); densissime cæspitosa, foliis erectis imbricatis linearibus dense sericeis obtusis concavis, perianthii tubo elongato subangulato non articulato, fauce glandulis 8 per paria laciniis oppositis instructa, laciniis tubo æquilongis. (*Gunn*, 2053.)

Hab. Summits of the Western Mountains, abundant, *Gunn.*—(Fl. Jan.)

Distrib. Victoria; Munyang Mountains, elev. 6000 feet, *Mueller.*

Gen. II. PIMELEA, *Sm.*

Perianthium infundibuliforme, limbo 4-fido; fauce esquamata. *Stamina* 1–2, fauce inserta. *Stylus* lateralis; stigmate capitato. *Nux* corticata v. baccata.—Frutices *v.* fruticuli *graciles, cortice tenacissimo;* foliis *oppositis rarius alternis sparsisve, integerrimis, subcoriaceis;* capitulis *sæpissime foliis difformibus involucratis, terminalibus, rarius axillaribus subspicatisve;* floribus *albis roseis v. flavis, interdum dioicis.*

A very beautiful genus, comprising some of the most elegant flowering shrubs in Australia and Tasmania; it is confined to those countries and to New Zealand. Upwards of seventy species are known to me, which grow in

about equal proportions in South-eastern and South-western Australia, and there are also a few tropical ones; few or no species inhabit both the East and West coasts.

This genus has been thus subdivided by C. A. Meyer (Bullet. Acad. St. Petersb. iv. 71):—

1. Gymnococca.—*Perianth* not articulate. *Fruit* succulent.—*P. drupacea, Gunnii, pauciflora.*

2. Heterolæna.—*Perianth* not articulate. *Tube of perianth* long. *Fruit* dry. *Albumen* abundant.—*P. nivea, sericea, pygmæa.*

3. Calyptrostegia.—*Perianth* with the tube articulate. *Fruit* dry.—*P. ligustrina, cernua, linifolia, glauca, flava, filiformis, gracilis.*

Erect or prostrate, glabrous or pubescent, or silky shrubs, with generally slender branches, covered with very tough stringy bark, and usually opposite, sessile (rarely alternate), entire leaves. *Flowers* capitate, rarely axillary or spicate, heads generally surrounded by a four- or more-leaved involucre. *Perianth* tubular or funnel-shaped, four-cleft, with two (rarely only one) stamens at the throat, and no scales. *Style* lateral. *Stigma* capitate. *Nut* usually enclosed in the dry or baccate perianth. (Name from πιμελη, *fatness*; in allusion to the oily seeds.)

§ 1. *Leaves opposite. Heads of flowers in elongated terminal peduncles, without involucral leaves.*

1. **Pimelea filiformis** (Nob. in Lond. Journ. Bot. vi. 280); glaberrima, caulibus gracillimis simpliciusculis, foliis oppositis lineari-oblongis ellipticisve subacutis planis marginibus tenuiter recurvis, floribus (parvis) in capitulum subspicatum pedunculatum ebracteatum dispositis, rachi pilosa, perianthio glabrato tubo gracili articulato laciniis elongatis, filamento elongato exserto. (*Gunn*, 6.) (Tab. XCV. *B.*)

Hab. Apparently very rare, though found in abundance in one spot near Penquite, Launceston, *Lawrence, Gunn.*—(Fl. Dec.)

Very nearly allied to the New South Wales *P. spicata*, but that species has decidedly spicate flowers, with shorter lobes to the perianth, and shorter stamens, and the leaves have not recurved margins. *Stems* very slender, prostrate, a foot and more long. *Leaves* in rather distant pairs, $\frac{1}{3}$–$\frac{1}{2}$ inch long, petiolate, glabrous, elliptical or ovate-oblong, acute. *Flowers* small, monandrous, two to six together, capitate, but showing a tendency to become spicate, rather shorter than the leaves. *Capitulum* generally pedunculate, rarely sessile.—Plate XCV. *B.* Fig. 1. head of flowers; 2, flower; 3, perianth, laid open; 4, stamens; 5, ovary:—*all magnified.*

§ 2. *Leaves alternate and opposite. Flowers capitate.*

2. **Pimelea gracilis** (Br. Prodr. 362); ramis gracilibus foliisque subtus præcipue appresse pilosis sericeisve, foliis alternis v. inferioribus oppositis lineari-lanceolatis oblongisve, capitulis axillaribus terminalibusque sessilibus foliis caulinis 2–3 involucratis, perianthii tubo gracili sericeo foliis æquilongo, limbi lobis oblongis obtusis, filamentis brevibus, stylo incluso.—Calyptrostegia gracilis, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. (*Gunn*, 25.)

Hab. Common by the banks of streams, etc., near Hobarton, New Norfolk, Launceston, etc.—(Fl. Nov.) (*v. v.*)

Distrib. Victoria, *Mueller.*

A slender bush, about 2 feet high. *Stems* erect or ascending, branched. *Branches* strict, silky, as are the under-surfaces of the leaves, and perianth. *Leaves* alternate and opposite, $\frac{1}{2}$ inch long, linear-oblong or linear-lanceolate, with recurved margins. *Heads of flowers* axillary and terminal, sessile, subtended by cauline leaves, but not by special bracts. *Perianth* generally yellow, slender, about as long as the leaves. *Stamens* nearly sessile.—Mueller sends from Victoria as a variety of this a prostrate, densely tufted plant, with four-angled, more slender stems, and broader, more usually opposite leaves; it is his var. *alpina*, from the Snowy River and summits of the Munyang Mountains.

§ 3. *Leaves all opposite. Flowers in terminal and axillary capitula. Drupe baccate.*

3. **Pimelea drupacea** (Lab. Nov. Holl. i. 10. t. 7); frutex orgyalis erectus, ramis elongatis virga-

tis, ramulis foliisque subtus appresse sericeis, foliis oppositis lineari- v. elliptico-lanceolatis oblongo-lanceolatisve, capitulis 3–8-floris ramulos brevissimos axillares terminantibus, perianthiis villoso-sericeis folia floralia oblonga subæquantibus tubo deciduo, drupa subbaccata.—*Br. Prodr.* 361; *Lodd. Bot. Cab.* 540; *Sweet, Fl. Aust.* 22. Gymnococca drupacea, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. (*Gunn,* 223.)

Var. β. *glabrata;* ramis foliisque fere glaberrimis. (*Gunn,* 873.)

Hab. Abundant in humid forests, in a rich soil.—(Fl. and frt. almost all the year.) (*v. v.*) Var. β. Circular Head, near the sea, *Gunn.*

Distrib. Victoria, *Müller.*

A very common species, growing 4–6 feet high, with appressed, silky, elongate, terete branches; the leaves also are more or less silky below and ciliated at the margins.—*Leaves* coriaceous, spreading, flat, blunt or subacute, 1 inch long and less, petiolate, oblong-lanceolate or elliptical-lanceolate or elliptical-oblong. *Capitula* irregular, terminating very short, axillary branchlets. *Perianths* about as long as the floral leaves, very silky, about one-third as long as the cauline leaves. *Drupes* black, ovate.

4. **Pimelea Gunnii** (Hook. fil.); frutex orgyalis ramosus, ramis elongatis, ramulis foliisque subtus dense sericeo-tomentosis lanuginosisve marginibus recurvis, foliis lineari-oblongis lanceolatis elliptico-lanceolatis acutis, capitulis 3–6-floris ramulos brevissimos axillares terminantibus, perianthio brevi dense villoso deciduo, drupa baccata nigra albumine copioso. (*Gunn,* 294.)

Hab. Dense forests, but not common, Mount Wellington, *Cunningham;* Franklin River, *Gunn.*—(Fl. Jan.)

The present so closely resembles *P. drupacea* in habit, stature, and characters, that it requires no detailed description, its very densely silky and villous branches, under surface of leaves and flowers, and smaller perianth and fruit, at once distinguish it.

§ 4. *Leaves all opposite, densely silky or woolly beneath. Flowers in terminal capitula. Fruit not baccate.*

5. **Pimelea nivea** (Lab. Nov. Holl. i. 10. t. 6); frutex orgyalis, ramis gracilibus strictis perianthiis foliisque subtus dense incano-tomentosis lanatisve, foliis patulis orbiculatis ovato-rotundatisve rarius oblongis basi rotundatis cordatisve coriaceis supra glaberrimis marginibus recurvis, capitulis terminalibus densifloris, perianthiis albis foliis longioribus tubo gracili elongato, filamentis gracilibus lobos æquantibus albumine copioso.—*Br. Prodr.* 361. Heterolæna nivea, *C. A. Meyer, Bullet. Acad. St. Petersb.* iv. 71. (*Gunn,* 4, 187, 734, 1243.)

Var. β. *incana;* ramulis lanatis, foliis latioribus.—P. incana, *Br. Prodr.; Lindl. Bot. Reg.* 1838. *t.* 24. Heterolæna incana, *C. A. Meyer, l. c.*

Hab. Abundant throughout the Island, ascending to 3500 feet.—(Fl. Sept., Oct.) (*v. v.*) (Cultivated in England.)

A very common, beautiful, and variable plant, not found hitherto in Victoria, which is remarkable. The *P. incana,* Br., appears to pass into *P. nivea* by insensible gradations, that is, assuming the plant figured in the 'Botanical Register' to be Brown's *P. incana.* It is there stated that the true *P. nivea* has imbricated leaves, with almost sessile anthers; but this is not the case with Labillardière's figure of *P. nivea* nor our specimens.—An upright, twiggy bush, 3–5 feet high. *Branches* slender; branchlets, leaves below, and flowers densely clothed with soft, white, woolly pubescence. *Leaves* very variable in form, short, $\frac{1}{3}$–$\frac{1}{2}$ inch long, orbicular or oblong or linear-oblong, rounded or cordate at the base, always spreading, very coriaceous, perfectly glabrous above, margins recurved. *Capitula* terminal, large, many-flowered. *Flowers* white or pink. *Perianth* longer than the leaves, slender. *Filaments* slender.

6. **Pimelea sericea** (Br. Prodr. 361); fruticulus 1–2-pedalis, ramulis foliisque subtus argenteo-sericeis nitidis, foliis imbricatis ellipticis ovatisve, capitulis terminalibus erectis densifloris, perianthii tubo elongato sericeo foliis longiore segmentis lato-elongatis, filamentis gracilibus, albumine copioso.—Heterolæna sericea, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. (*Gunn*, 288.)

Hab. Summits of all the mountains, elev. 3–4000 feet.—(Fl. Nov.–Jan.) (*v. v.*)

A very beautiful species, forming a small, branched bush, 1–2 feet high, the branches densely covered with elliptical or ovate, imbricating leaves, about ½ inch long, glabrous above, beneath densely clothed with very shining, silvery hairs. *Capitula* large, erect, many-flowered. *Perianths* silky, longer than the leaves.

7. **Pimelea cinerea** (Br. Prodr. 361); "foliis lanceolato-oblongis planis subtus incanis supra glabris, floralibus capitulo paucifloro longioribus, perianthii tubo ovato persistenti, fructu exsucco."—*Br. l. c.*

Hab. Tasmania, *Brown.*

Of this species I know nothing; it is placed between *P. sericea*, which has terminal capitula, and *P. drupacea*, in which they are spuriously axillary, and may be best distinguished by the leaves being lanceolate-oblong, and hoary beneath, and the tube of the perianth persistent.

§ 5. *Leaves all opposite, glabrous or sparingly pilose. Flowers in terminal capitula, surrounded by evident bracts, forming a conspicuous involucre. Fruit dry.*

8. **Pimelea ligustrina** (Lab. Nov. Holl. i. 9. t. 3); frutex orgyalis glaberrimus, ramis ramulisque gracillimis, foliis amplis variis oblongis lineari- v. oblongo-lanceolatis obtusis acutis acuminatisve membranaceis subtus glaucescentibus, capitulis magnis globosis multifloris pedunculatis, bracteis 4 late ovatis ciliatis intus pubescentibus perianthio elongato medio articulato sericeo brevioribus, rachi breviter villosa, filamentis gracilibus.—*Br. Prodr.* 360. Calyptrostegia ligustrina, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. P. hypericina, *A. Cunn. in Bot. Mag. t.* 3330. P. elata, *Muell. MSS.; Meisn. in Linnæa*, xxvi. 349. (*Gunn*, 3.)

Hab. Common in dense, humid forests, chiefly in the northern part of the Island.—(Fl. Dec.)

Distrib. Victoria, *Mueller, etc.;* New South Wales, *Brown.*

Much the largest-leaved species of the genus, and Gunn says the most beautiful of the Tasmanian ones: it is readily distinguished by its size, glabrous, slender stems, and large, membranous, veined leaves, that vary from 1–2 inches long, and from oblong to linear-lanceolate, and by the peduncled, globose, involucrate heads of very numerous, crowded flowers.

9. **Pimelea flava** (Br. Prodr. 361); fruticulus erectus dioicus, ramulis puberulis gracillimis, foliis parvis obovatis orbiculatisve obtusis (sicco viridibus) glaberrimis dorso carinatis, capitulis terminalibus erectis, bracteis 4 late obovatis orbiculatisve glaberrimis, perianthiis medio articulatis parvis sericeis.—Calyptrostegia flava, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. (*Gunn*, 622.)

Hab. In poor clay soil, but not common: Hobarton, Georgetown, and on the east coast, *Gunn.*—(*v. v.*)

Distrib. South coast of Australia, *Brown;* New South Wales, *Cunningham.*

A very delicate and pretty little plant, about 2 feet high, with slender, twiggy, erect, pubescent branches, and small, opposite, obovate or orbicular, suberect, glabrous leaves, about ¼–⅓ inch long; they turn green in drying, and have a prominent costa below. *Capitula* small, sessile, terminal, erect, with four large, broad, involucral leaves. *Flowers* yellow, diœcious, small. *Perianth* short, silky.

10. **Pimelea cernua** (Br. Prodr. 359); fruticulus glaber erectus, ramis gracilibus glaberrimis, foliis lineari-spathulatis oblongis v. lanceolatis subacutis 1-nerviis marginibus planis, capitulis multifloris terminalibus cernuis, bracteis 4 ovatis acutis glabris capitulo æquilongis brevioribusve, perianthiis sericeo-pilosis.

—P. spathulata, *Lab. Nov. Holl.* i. 9. *t.* 4. P. nutans, *Meisn. in Linnæa,* xxvi. 348. Calyptrostegia spathulata, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. (*Gunn,* 623, 1244.)

Hab. Common in dry, sandy tracts, throughout the Island.—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia, New South Wales, and Victoria.

A very pretty plant, 2 feet or so high, with a slender, very sparingly branched, glabrous stem, bearing erect, linear or linear-oblong or linear-spathulate leaves, $\frac{1}{2}$–$\frac{2}{3}$ inch long, and terminal, nodding, many-flowered heads.—*Leaves* one-nerved, quite glabrous, not thickened or recurved at the margin. *Bracteal leaves* ovate, acute, glabrous. *Flowers* cream-coloured, the tube silky, but not so densely as to be white.—Meisner distinguishes this from Smith's *P. linifolia* by the nodding capitula, smaller, less pubescent flowers, and exserted style, but a large suite of specimens shows occasional individuals with all these characters.

11. **Pimelea linifolia** (Smith, Pl. Nov. Holl. 31. t. 11); fruticulus glaber erectus, ramis gracilibus glaberrimis, foliis lineari-oblongis lanceolatis spathulatisve 1-nerviis marginibus planis, capitulis multifloris terminalibus erectis, bracteis 4 ovatis acutis glabris capitulo brevioribus, perianthiis medio articulatis dense sericeis.—*Br. Prodr.* 359; *Bot. Mag. t.* 89. Calyptrostegia linifolia, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71.

Hab. Tasmania, *Brown.*

Distrib. South-eastern Australia, common, from Port Jackson to Victoria. (Cultivated in England.)

I have seen no Tasmanian specimens of this plant; what Gunn sends under the name (No. 1244, saying that it is easily distinguished by Brown's characters from *P. cernua*) is only a small specimen of *cernua*, having neither the densely silky perianths nor upright capitula of *P. linifolia*. These two species are however very nearly allied, and may merge into one. I have examined forms of both from Southern Australia (some of Mueller's especially), that prove them both to be extremely variable.

12. **Pimelea glauca** (Br. Prodr. 360); fruticulus suberectus v. prostratus, ramis ramulisque glaberrimis, foliis erectis imbricatis obovato-oblongis lanceolatisve acutis subcarinatis glaucis coriaceis, capitulis terminalibus erectis, bracteis 4 ovatis acutis 2 interioribus ciliatis, perianthiis supra articulationem sericeis, rachi penicillata.—*Rudge in Linn. Trans.* x. 286. *t.* 13. *f.* 2. Calyptrostegia glauca, *C. A. Meyer in Bullet. Acad. St. Petersb.* iv. 71. (*Gunn,* 441, 732, 733, 872.)

Hab. Common in light sandy soil, especially upon the north coasts.—(Fl. Nov.) (*v. v.*)

Distrib. South-eastern Australia, from Port Jackson to Melbourne. (Cultivated in England.)

Generally a small and prostrate species, though some of my specimens are erect and twiggy.—*Stems*, branches, and foliage quite glabrous. *Leaves* $\frac{1}{3}$–$\frac{2}{3}$ inch long, erect, imbricating, coriaceous, glaucous, ovate or obovate-lanceolate or oblong, acute, with a strong dorsal costa. *Heads* terminal, erect. *Bracts* ovate, acute, the two inner more or less (generally deeply) ciliated. *Flowers* silky, their general receptacle covered with long, snow-white hairs.

§ 6. *Leaves all opposite, glabrous. Capitula terminal. Involucral leaves scarcely differing in form from the cauline.*

13. **Pimelea humilis** (Br. Prodr. 361); nana, caulibus erectis prostratisve breviusculis pubescentibus villosisve, foliis oblongis lineari-oblongisve obtusis utrinque glabris 1-nerviis, capitulis terminalibus erectis multifloris, bracteis 4 oblongis ovato-oblongisve obtusis, perianthiis sericeis.—*Bot. Reg.* 1268. (*Gunn,* 5, 197.)

Hab. Abundant in dry hills and pastures throughout the Island.—(Fl. Oct., Nov.) (*v. v.*)

Distrib. South-eastern Australia; Victoria. (Cultivated in England.)

A small, generally prostrate, and much branched species, readily distinguished by the pubescent or villous stems and branches, 2–8 inches high, oblong, blunt, glabrous leaves, and glabrous bracteal leaves, which are also blunt, rather broader than the cauline, sometimes ovate, and often margined with red.

14. **Pimelea pauciflora** (Br. Prodr. 360) ; frutex glaberrimus dioicus, ramis gracilibus, foliis linear- v. obovato-oblongis lineari-lanceolatisve acutis acuminatisve, floralibus 2 floribus multo longioribus, floribus parvis 2–4 terminalibus sessilibus rachique glaberrimis, perianthiis persistentibus nucem corticantibus sicco membranaceis.—*Lodd. Bot. Cab.* 179. (*Gunn,* 195.)

Hab. Rich soil by the banks of streams, but not common: Launceston, Grindelwald, St. Patrick's and Lake Rivers.—(Fl. Dec.)

Distrib. South-eastern Australia, from Wide Bay to Melbourne. (Cultivated in England.)

A very distinct but variable bushy species, 4–6 feet high, with slender glabrous branches, often bearing abbreviated floriferous branchlets in the axils of the leaves. *Leaves* perfectly glabrous, ½–1½ inch long, varying from obovate-oblong to linear-lanceolate, quite glabrous, membranous. *Flowers* two to four together, sessile between the upper pair of leaves, diœcious. *Perianth* quite glabrous, short, ⅛ inch long; female turgid, with very small mouth and small lobes, persistent, forming (when dry) a membranous bladdery utriculus around the fruit, which Gunn describes as a white drupe.

15. **Pimelea pygmæa** (Mueller in Linnæa, xxvi. 346) ; suffruticulus depressus ramosissimus, foliis (parvis) densis imbricatis coriaceis elliptico-ovatis obovatisve dorso subcarinatis laxe ciliatis, floralibus consimilibus, floribus (dioicis?) terminalibus solitariis paucisve foliis supremis occultis, perianthio brevi urceolato limbi lobis superne dorso ciliatis. (*Gunn,* 2017.)

Hab. Summit of the Western Mountains, elev. 4000 feet, *Gunn.*—(Fl. Jan.)

All my specimens of this curious little species are in fruit; and from the appearance of the persistent perianth and stamens, it appears to be diœcious, the anthers of the female flowers being small and apparently effete. It forms densely-matted mossy patches, growing quite flat to the ground. *Stems* rather stout, and branches tufted. *Leaves* concave, imbricating, 2–3 lines long, elliptical-ovate, ciliate with a few long hairs. *Flowers* small, females solitary, hidden amongst the upper leaves. *Ovary* with a pencil of hairs at the apex.

Nat. Ord. LXXXII. SANTALACEÆ.

Of this curious Natural Order there are nearly fifty Australian species known to me, almost all of them either leafless plants, or provided with minute scales instead of leaves; many are probably root-parasites, an interesting point worthy of the attention of the Colonial observer, as is the development of their ovules and seeds, which in *Santalum* and some allied plants present most remarkable anomalies. The affinities of the Order are not with those which are placed next to it here, but with *Olacineæ* and *Loranthaceæ,* of neither of which are there any Tasmanian representatives. The Australian genera, *Exocarpus* and *Anthobolus,* have been removed from the Order on account of their superior fruit; but, as the ovary of *Santalum* is free in a young state, this character cannot be of ordinal value, and in all other respects they are truly Santalaceous. The true Sandal-wood is Polynesian, and some closely allied species inhabit tropical Australia. The majority of the Australian *Santalaceæ* are however extratropical, and confined to the South-west coast.

Gen. I. EXOCARPUS, *Lab.*

Flores polygami v. hermaphroditi, glomerati v. spicati, bracteis caducis. *Perianthium* rotatum, 4–5-partitum. *Stamina* 5, basi laciniarum inserta, filamentis brevissimis. *Ovarium* stylo brevissimo; *stigmate* obtuso. *Nux* 1-sperma, supera, corticata, pedicello ampliato baccato insidens. *Embryo* minutus axi albuminis carnosi; *radicula* supera; *cotyledonibus* minimis.—Arbores *v.* frutices; ramis *ramulisque subarticulatis, ultimis interdum foliaceo-dilatatis;* foliis *minimis squamæformibus, rarius majoribus planis;* spicis glomerulisve *axillaribus;* floribus *minimis, sessilibus, viridibus.*

A very remarkable genus, found in all parts of Australia, and one of the Australian tropical species also inhabits the Malayan Islands; there are also a New Zealand, and one or two Polynesian species. About a dozen Australian kinds are known to me.—*Trees*, often conical, or shrubs, with jointed, furrowed, slender green branches and branchlets, and minute (rarely linear or broad flat) leaves. *Flowers* very minute, in small axillary spikes or glomerules, sessile. *Perianth* four- or five-parted, rotate, valvate. *Stamens* one opposite each lobe of the perianth, almost sessile. *Stigma* almost sessile. *Fruit* an oblong or globose one-seeded nut, seated on the baccate apex of the peduncle. (Name from εξω, *outside*, and καρπος, *fruit*; the swollen peduncle resembling the fruit.)

1. **Exocarpus cupressiformis** (Lab. Voy. i. 115. t. 14); arborea, ramis ramulosis, ramulis gracilibus teretiusculis, foliis minutis denticulæformibus patulis, spicis breviter pedunculatis, nucibus globosis oblongisve lævibus. (*Gunn*, 538.)

Hab. Common in most parts of the Island, but rare to the North-west.—(Fl. Sept.) (*v. v.*) "Native Cherry" and "Cherry-tree" of the Colonists.

Distrib. South-eastern Australia; New South Wales and Victoria. (Cultivated in England.)

A very common, and, according to Gunn, variable, small, pale-green, leafless tree or shrub, sometimes having a straight trunk, and conical, cypress-like head, 20 feet high, at others having weeping branches, and again being a small shrub, with fastigiate branches.—*Branches* very numerous, much divided, slender, nearly terete.—*Leaves*, minute scales. *Spikes* 1–1½ line long, shortly peduncled. *Nuts* ¼ inch long, globose or ovoid, the swollen peduncle oblong, scarlet, eatable, but austere.

2. **Exocarpus stricta** (Br. Prodr. 357); frutex erectus fastigiatim ramosus, ramulis angulatis flexuosis subtriquetris striatis, foliis minutis denticulæformibus, spiculis glomeruliformibus subsessilibus, nucibus globosis lævibus, pedunculo incrassato albo. (*Gunn*, 539.)

Hab. Common in poor land.—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales and Victoria. (Cultivated in England.)

An erect bush, 3–5 feet high, with flexuous branches, and long, slender, acutely three-angled, striated branchlets. *Leaves* as in *E. cupressiformis*. *Spikes* short, and almost sessile. *Peduncle of the fruit* small, white, transparent.

3. **Exocarpus humifusa** (Br. Prodr. 356); humilis, depressus, caule fruticoso procumbente, ramis ramulisque teretibus sulcatis, foliis minutis denticulæformibus, spiculis sessilibus glomeruliformibus, floribus 4-fidis, nuce oblonga.—E. nanus, *Nob. in Lond. Journ. Bot.* vi. 281. (*Gunn*, 317.)

Hab. Alpine regions, not uncommon at elevations of 1500–4000 feet, *Gunn*.

Distrib. Alps of Victoria; Cobboras Mountain, *Mueller*. (Cultivated in England.)

My Tasmanian specimens are very small, and not in flower; they resemble minute specimens of *E. cupressiformis*, but the perianth is four-cleft. The nut is very small, ovoid, about 1½ line long; the plant appears to grow quite prostrate amongst stones, moss, etc.

Gen. II. LEPTOMERIA, *Br.*

Flores spicati, 1-bracteati, rarius solitarii et ebracteati. *Perianthium* rotatum, persistens, 4–5-partitum. *Stamina* 4–5, sub disco epigyno 4–5-lobo inserta. *Stigma* lobatum. *Drupa* coronata.—Frutices *aphylli, v. foliis minimis, denticulæformibus;* floribus *minimis;* bracteis *deciduis;* drupa *plerumque baccata, acida.*

Of this curious genus about twenty species are known, all of them confined to Australia and Tasmania, and the majority to the Swan River Colony. All are shrubs, leafless, or with minute scale-like leaves, and small axillary spikes of extremely minute flowers. *Perianth* rotate, four- or five-cleft, with as many stamens at the base of its lobes, inserted beneath a lobed epigynous disc. *Stigma* lobed. *Drupe* with an areola at the top, surrounded by the

persistent remains of the perianth. (Name from λεπτος, *slender*, and μερος, *a part*; in allusion to the slender stems and branches.)

1. **Leptomeria Billardieri** (Br. Prodr. 354); frutex aphyllus v. foliis paucis minimis, ramulis gracilibus angulatis, floribus spicatis, perianthio 5-fido, bracteis lanceolatis caducis, stigmate stellatim 5-fido, disci glandulis distinctis, drupa carnosa.—Thesium drupaceum, *Lab. Nov. Holl.* i. 68. *t.* 93. (*Gunn*, 260.)

Var. β. *humilis;* 1–2-pedalis, caule ramisque robustis.—An sp. distincta? (*Gunn*, 1245.)

Hab. In poor moist soil, especially sandy places near the North coast.—(Fl. Oct.) (*v. v.*) Var. β. Lake St. Clair, *Gunn.*

Distrib. New South Wales and Victoria. "Native Currant" of colonists.

An erect, very pretty shrub, according to Gunn, 4–7 feet high, with erect but not stiff branches, white flowers, and greenish-red berries of a pleasant acid taste. *Branches* slender, striated. *Flowers* in slender axillary spikes, ¼–½ inch long, very minute, pedicelled, with a deciduous bract at the base of the pedicel. *Perianth* five-lobed. —The var. β appears to me to be a form of this, growing only 1–2 feet high, with very much shorter, stouter, rigid branches, unaccompanied with any difference in the flower and fruit. A species of homopterous insect covers the branches of this variety with its curious white nidus.

Gen. III. THESIUM, *L.*

Flores racemosi, pedunculis bracteis persistentibus foliaceis adnatis. *Perianthium* tubulosum, infundibuliforme v. hypocrateriforme, persistens, 4–5-fidum, eglandulosum, disco epigyno nullo. *Stamina* laciniis perianthii inserta, dorso barbata. *Nux* corticata, perianthio coronata.—Herbæ v. suffruticuli *graciles;* foliis *angustis, linearibus, alternis;* racemis *terminalibus;* floribus *parvis.*

A very curious genus of herbaceous plants, abundant in Southern Europe and Western Asia, parasitic on roots. —*Stems* slender. *Leaves* linear. *Racemes* terminal. *Flowers* tribracteate, adnate to the petiole of the large bract, which is leafleted, and with the two smaller bracts placed laterally beneath the perianth.—*T. australe* is the only Australian species, and has slender, simple, or sparingly branched stems, 6–8 inches high. *Leaves* very narrow, 1 inch long, acuminate, bracteate, similar to the cauline. *Flowers* solitary, almost sessile, about 1 line long. *Perianth* four- or five-cleft, its segments about as long as the tube. (Name a Greek one, θησιον, applied to some plant.)

1. **Thesium australe** (Br. Prodr. 353); caule gracili, foliis anguste linearibus acuminatis, racemo elongato, floribus subsessilibus, perianthii laciniis tubo subæquilongis longitudinaliter marginatis.

Hab. Tasmania, *Lawrence.*

Distrib. New South Wales and Victoria.

Nat. Ord. LXXII. EUPHORBIACEÆ.

In accordance with the arrangement of De Candolle, I have placed this Natural Order amongst the *Monochlamydeæ*, but its nearest affinities are undoubtedly with *Malvaceæ* and *Rhamneæ*. I have seen upwards of 150 Australian species of this Order, amongst which are probably included most of those described species which I have not been able to identify by their descriptions, for fully two-thirds of the above I have been unable to name. These are included under about 40 genera, of which about 15 are peculiar to Australia, and the remainder are principally natives of India and the Malayan Archipelago. About 50 are tropical plants, several of which are rather widely distributed, belonging to the genera *Phyllanthus, Euphorbia, Omalanthus,* and *Röttlera.* About 40 species are confined to South-west Australia, and the majority both of genera and species are found in New South Wales and Victoria. Of the closely allied

Order *Antidesmeæ* there are three or four tropical Australian species, some of which are identical with Indian ones.

Gen. I. RICINOCARPUS, *Desf.*

Flores monoici. *Calyx* 4–5-partitus, laciniis valvatis. *Petala* 4–5, convoluta. Masc. *Stamina* plurima; *filamentis* in columnam basi 5-glandulosam a basi ad apicem antheriferam connatis; *antheris* adnatis, extrorsis. Fœm. *Ovarium* papillosum, squamis 5 hypogynis, 3-loculare, loculis 1-ovulatis; *stylo* brevi; *stigmatibus* 3, linearibus, bipartitis. *Capsula* globosa, echinata, 3-sulca, 3-cocca, coccis monospermis.—Frutices; foliis *alternis, coriaceis, confertis, anguste linearibus, integerrimis, margine revolutis, mucronatis;* floribus *terminalibus, solitariis corymbosisve;* pedicellis *clavatis, basi 2-bracteatis.*

I find about ten or twelve species of this genus in the Hookerian Herbarium, of which I suspect some are very variable in habit; the majority are natives of the South-western quarter of the continent, and the remainder of the South-eastern and Tasmania.—*R. pinifolius*, the only Tasmanian species, is a small, erect, branching, glabrous shrub, 2–4 feet high, with numerous alternate leaves, which are about an inch long, suberect, very narrow-linear, acuminate, their margins revolute almost to the midrib. *Flowers* monœcious, erect, about $\frac{1}{3}$–$\frac{2}{3}$ inch long, on long, strict pedicels, bracteolate at the base, towards the ends of the branchlets, the female uppermost, with shorter peduncles; males generally axillary, and with the peduncle longer than the leaf, often imperfectly jointed about the middle. *Calyx* obconic, irregularly four- or five-lobed; lobes blunt, minutely ciliated. *Corolla* of five imbricate white petals, twice to four times as long as the calyx. *Male* flower with a long cone of stamens united by their filaments, the anthers extrorse. *Female* a three-celled ovary, subtended by five hypogynous scales, and having three linear bipartite stigmas. *Capsule* $\frac{1}{2}$ inch long, densely covered with soft waving spines, woody, three-celled, of three woody cocci, that separate from a persistent central column, and dehisce down the ventral suture; *epicarp* coriaceous, easily separating from the crustaceous woody endocarp. *Seed* narrow-oblong, with a smooth, shining, polished, mottled testa, and prominent caruncula at the top. (Name from the similarity of the fruit and seed to that of the Castor Oil, *Ricinus Palma-Christi*.)

1. **Ricinocarpus pinifolius** (Desf. Mem. Mus. iii. t. 22); frutex erectus glaberrimus, foliis pollicaribus anguste linearibus acuminatis rigidis subpungentibus marginibus ad costam fere revolutis, pedunculis solitariis 1-floris erectis foliis longioribus brevioribusve.—*Endl. Iconogr.* 124. R. sidæformis, *Mueller.* Rœperia pinifolia, *Spr. Syst.* iii. 147. (*Gunn*, 744.)

Hab. Abundant on sand-hills near the sea, from fourteen miles east of Georgetown, *Gunn.*—(Fl. Oct.)

Distrib. Eastern and South-eastern Australia, from Moreton Bay to South Australia.

Gen. II. BEYERIA, *Miq.*

Flores dioici. Masc. *Calyx* 5-partitus, laciniis inæqualibus æstivatione imbricatis. *Corolla* 0. *Stamina* 12 v. plura, pluriserialia, receptaculo conico inserta; *filamentis* breviusculis; *antheris* extrorsis, oblongis. Fœm. *Calyx* 5-fidus, laciniis ellipticis erectis inæqualibus. *Pistillum* oblongum, obtuse trigonum, 3-loculare; stigmate magno, discoideo, sessili, ovarium tegente; ovulis loculis solitariis pendulis. *Capsula* 3-cocca, lævis; coccis 2-valvibus, 1-spermis. *Semina* oblonga, trigono-compressa, hilo lato carunculoso.—Frutices *erecti, ramosi, viscosi, glabri v. tomentosi;* foliis *exstipulatis, alternis, integerrimis;* floribus fœm. *solitariis v. paucis pedunculatis;* masc. *sæpe racemosis;* pedicellis *minute bracteolatis.*

I have followed Endlicher (Gen. Plant. Suppl. iv. 90) in adopting the name of *Beyeria* for this genus, instead of *Calyptrostigma*, Klotzsch, which appeared about the same time ('Plantæ Preissianæ,' i. 175). I have seen about fifteen species of the genus, the majority of which are natives of South-western Australia. All are shrubby, with

angular branches, and the leaves alternate, coriaceous, entire, exstipulate, generally viscous, glabrous or pubescent. *Flowers* diœcious. *Males* generally racemose, pedicelled, the pedicels bracteolate. *Females* solitary or few. *Calyx* of five unequal laciniæ, imbricate in æstivation. *Corolla* 0. MALE. *Stamens* numerous, collected upon a central receptacle; *filaments* short; *anthers* extrorse. FEMALE. *Ovary* three-celled, with three pendulous ovules, almost covered with the broad, discoid, sessile stigma. *Capsule* three-celled, three-valved, with three compressed trigonous seeds. (Named in honour of a Dutch botanist.)

1. **Beyeria oblongifolia** (Hook. fil.); viscosa, ramulis foliisque subtus tomento arctissime appresso albidis, foliis (1–2-pollicaribus) lineari-oblongis lanceolatisve subacutis subtus enerviis, floribus masc. paucis subracemosis, fœm. solitariis.—Calyptrostigma oblongifolia, *Klotzsch, Plant. Preiss.* i. 176 *in not.* (*Gunn,* 12, 1246.)

HAB. Abundant in shaded places, especially on the rocky banks of rivers.—(Fl. Nov.) (*v. v.*)

DISTRIB. New South Wales and Victoria.

I very much doubt if this will prove distinct from the *B. viscosa*, Ann. Sc. Nat. ser. 3. i. t. 15 (*Croton viscosum*, Labillardière), of which I have examined two authentically-named specimens, both collected by Labillardière; one (the plant he afterwards published), in South-western Australia, has distinct veins on the under-surface of the leaves, which are not white; the other, *Croton viscosum*, var., was gathered in Tasmania, and is that here described. —A shrub or small tree, 6–30 feet high, with viscous branches, leaves, peduncles, and capsules. *Leaves* 1–2 inches long, lanceolate or oblong-lanceolate, blunt or hardly acute, below nerveless or very obscurely veined, white below, with closely appressed down, as are the branches, peduncles, and capsules. *Male flowers* few together, on a short axillary peduncle, about $\frac{1}{3}$ inch in diameter; *calyx* membranous, segments orbicular. *Female flowers* with erect coriaceous calyx-segments. *Capsule* about as large as a pea.

2. **Beyeria Backhousii** (Hook. fil.); fruticosa, ramulis pubescentibus, foliis ($\frac{1}{2}$–1-uncialibus) anguste oblongo- v. lineari- v. elliptico-lanceolatis acutis marginibus recurvis subtus enerviis dense niveo-tomentosis costa valida. (*Gunn,* 540.)

HAB. Flinders' Island, Bass' Straits, *Backhouse.*

DISTRIB. South-eastern Australia, near the sea; common.

A much smaller species than *B. oblongifolia*, generally not exceeding a foot in height, with narrower leaves, seldom 1 inch long, with recurved margins, snow-white beneath, with appressed tomentum, nerveless, but with a stout, pale, reddish-brown costa. *Flowers* similar to but smaller than in *B. oblongifolia.*

Gen. III. BERTYA, *Planch.*

Flores monoici, bracteis 5–6 calyciformibus involucrati. *Calyx* coloratus, 5-partitus, membranaceus, æstivatione imbricatus. *Corolla* 0. MASC. *Stamina* plurima in fasciculum dense congesta; *filamentis* brevibus; *antheris* oblongis, extrorsis. FŒM. *Ovarium* 3-loculare; *stylis* 3, tripartitis; *ovario* 3-loculari; *ovulis* 3, pendulis. *Capsula* oblonga, calyce aucto inclusa, abortu monosperma. *Semen* oblongum; testa crustacea, fusca, caruncula alba lunata.—Fruticuli *virgatim ramosi, viscosi;* foliis *alternis, confertis, exstipulatis, coriaceis, margine sæpius recurvo;* floribus *axillaribus, solitariis, inferioribus masculis.*

There are five described species of this genus, all natives of Eastern and South-eastern Australia. The genus is nearly allied to *Beyeria*, but differs in the three trifid stigmas, in the capsule ripening but one seed, in the flowers being all axillary and solitary, and enclosed in membranous or coriaceous bracts. All are small shrubs, with small, coriaceous, exstipulate, alternate leaves. (Named in honour of *Count Léonce de Lambertye*, an eminent horticulturist.)

1. **Bertya rosmarinifolia** (Planch. in Lond. Journ. Bot. iv. 473. t. 16 A. fig. 2–5); fruticulus

erectus, foliis rigidis linearibus supra glabris subtus appresse incanis, floribus breve pedicellatis, stylis 3 distinctis profunde tripartitis. (*Gunn*, 624.)

Hab. Abundant on the Nile rivulet and South Esk River, about sixteen miles from Launceston, *Gunn;* Great Swan Port, *Backhouse.*—(Fl. Dec.)

Distrib. Blue Mountains in New South Wales, and Victoria.

A small, erect shrub, 1–6 feet high in Australia, with terete, pubescent branches, and linear, rigid, almost pungent leaves, $\frac{3}{4}$–1 inch long, with revolute margins; under surface white and tomentose; petiole short. *Flowers* on short, stout, axillary peduncles, about $\frac{1}{4}$ inch in diameter. *Capsule* oblong, pubescent.—The bracts, placed at the top of each peduncle, and surrounding the flower, entirely resemble the so-called calyx of *Beyeria*, but, as Planchon observes that they sometimes contain two flowers, a male and female, it becomes doubtful whether the so-called calyx of the female flower of *Ricinocarpus* and *Beyeria* is anything more than a series of bracts. The subject of the floral envelopes of *Euphorbiaceæ* requires a systematic investigation.

Gen. IV. AMPEREA, *A. Juss.*

Flores parvi, monoici v. dioici. Masc. *Calyx* campanulatus, 3–5-fidus; laciniis valvatis, patentibus. *Corolla* 0. *Stamina* 8, filamentis filiformibus ima basi connatis, 4 exterioribus brevioribus; *antherarum* loculis ovatis e apice connectivi granuliformis pendulis. Fœm. *Calyx* 3–5-partitus; laciniis rigidis, persistentibus, acutis. *Ovarium* glabrum, 3-loculare, loculis 1-ovulatis. *Stylus* brevis; stigmata 3, erecta, bifida, laciniis acutis. *Capsula* ovoidea, tricocca; coccis bivalvibus 1-spermis, ab axi columellæformi deciduis.—Suffruticuli *spartei;* ramis *compressis, erectis v. virgatis;* foliis *raris, stipulatis, alternis, brevibus, acutis;* floribus masc. et fœm. *plerumque in eodem stirpe remotis, minutis, axillaribus;* pedunculis *multibracteatis, rigidis.*

A curious genus of often nearly leafless plants, consisting in most cases of slender, compressed and acutely angled, flexuous, rigid stems and branches, somewhat like those of *Leptomeria*, furnished here and there with minute leaves and small tufts of minute flowers, surrounded with rigid bracts. About ten species are known to me.—*A. spartioides*, the only Tasmanian species, is a diœcious, suffrutescent plant, 1–3 feet high, consisting of a short, woody stem, that sends up numerous flexuous or strict, sparingly divided, much compressed, almost two-edged branches, about $\frac{1}{6}$ inch broad; these are deeply grooved and two- to three-ribbed in the centre, and at intervals of an inch or so bear alternately minute glomeruli of flowers. The leaves are found chiefly on young plants and shoots, and are small, $\frac{1}{4}$–$\frac{1}{2}$ inch long, elliptical-oblong or obovate, acute, irregularly toothed, glaucous below, very shortly pedicelled; pedicels bracteolate. *Flowers* surrounded by dark-coloured, imbricating bracts. Males. *Calyx* campanulate, quinquefid, its segments valvate. *Corolla* none. *Stamens* eight, the filaments combined at the base, four outer shorter. *Anther-cells* pendulous from the thickened, granulate connective. *Females* with a persistent, rigid calyx. *Ovary* smooth, three-celled, three-ovuled, with three erect, bifid stigmas. *Capsule* $\frac{1}{6}$ inch long, small, ovoid, of three crustaceous, two-valved cocci, that separate from a woody, persistent axis; each coccus has towards its apex two short tubercles or horns, one on each side. *Seeds* shortly oblong, with a dark brown testa, and very large caruncula. (Named in honour of *M. Ampère*, a celebrated chemist.)

1. **Amperea spartioides** (Brongniart in Voy. Coquill. t. 49. f. A.); erecta, ramis ramulisque adultis subaphyllis elongatis ancipiti compressis profunde sulcatis medio alte costatis, fasciculis florum parvis alternis remotis, foliis in ramulis junioribus ovato-ellipticis acutis dentatis, adultis linearibus v. 0, stipulis setaceis, capsulis coriaceis, coccis apice utrinque tuberculatis cornutisve.—*Achille Richard, Sert. Astrolab.* 53. *t.* xx. A. cuneifolia, *Mueller.* Leptomeria xyphoclados, *Sieber, Pl. Exsicc.* 135. (*Gunn*, 190.)

Hab. Abundant in poor sandy soil.—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales and Victoria.

Gen. IV. PHYLLANTHUS, *Swartz.*

Flores monoici v. dioici. *Calyx* 5–6-partitus, laciniis biseriatis. Masc. *Stamina* 3 (rarius 5); filamentis in columnam coalitis, basi glandulis 5–6 v. disco 5–6-lobo cinctis; antheris extrorsis adnatis. Fœm. *Ovarium* glandulis 5–6 v. disco 5–6-lobo cinctum, 3-loculare; loculis 2-ovulatis. *Styli* 3, basi interdum cuneati, plerumque bifidi; stigmatibus 6. *Capsula* 3-cocca, coccis bivalvibus.—Arbores, frutices, *v.* herbæ; foliis *plerisque distichis stipulatis, rarius* 0 *v. ramulis foliacco-dilatatis*; floribus *axillaribus, pedicellatis, solitariis fasciculatisve, bracteatis, fasciculis monoicis dioicisve.*

A very extensive tropical genus, many species of which have very wide ranges, some indeed being almost universally distributed tropical weeds. About five-and-twenty Australian species are known to me, some of which are tropical, and several of them are perhaps Indian weeds.—*Herbs* or *shrubs*, rarely small trees, the Australian species of which have slender, angled branches, and alternate, often distichous, stipulate, entire, deciduous leaves, that generally blacken in drying. *Flowers* axillary, solitary or crowded, monœcious or dioecious, small, green. *Calyx* five- or six-parted, the segments in two series, imbricate in æstivation. *Male* flowers with five or six stamens in the centre of the flower, subtended by as many glands, or a lobed disc, their filaments connate; anthers adnate, extrorse. *Female* a three-lobed, three-celled, six-ovuled ovary, seated on a disc, with three simple or bifid stigmas. *Fruit* a membranous or crustaceous capsule, of three two-seeded, two-valved cocci. (Name from *φυλλον, a leaf*, and *ανθος, a flower*; because some of the species (but not the Australian) have phyllodia bearing the flowers.)

1. **Phyllanthus Gunnii** (Nob. in Lond. Journ. Bot. vi. 284); frutescens v. subarborea, glaberrima, ramulis glaberrimis subangulatis, foliis alternis distichis breve petiolatis obovatis apiculatis, stipulis ovato-subulatis, floribus monoicis solitariis fasciculatisve gracile pedicellatis 5-meris, antheris inclusis, stigmatibus 3 simplicibus.—*An* P. indigoferoides, *A. Cunn.?* (*Gunn*, 233.)

Hab. Dense forests at Georgetown, Circular Head, and Rocky Cape, *Gunn.*—(Fl. Nov.)

Distrib. New South Wales and Victoria.

A shrub 4–5 feet high, which, according to Mueller, sometimes attains the height of 12 feet in Victoria Gunn describes it as having a slender, weak stem, inclined from the great weight of the foliage.—*Branchlets* slender *Leaves* $\frac{2}{3}$–1 inch long, obovate, apiculate, quite glabrous. *Flowers* small, very numerous, solitary or fascicled, axillary, green. *Calyx* of five green sepals, with white margins. *Anthers* of male flowers included. *Ovary* with three spreading, subulate styles. *Capsule* small, about $\frac{1}{2}$ inch long. *Seeds* trigonous, subreniform, attached by the middle.

2. **Phyllanthus Australis** (Nob. in Lond. Journ. Bot. vi. 284); humilis, depressa, ramis cæspitosis procumbentibus ramulis ascendentibus, foliis parvis ellipticis acutis mucronatisve coriaceis, pedicellis robustis, floribus paucis, calyce 6-partito, stigmatibus simplicibus. (*Gunn*, 739, 740.)

Hab. Probably common, but overlooked: roadsides, Hobarton, Campbelltown, New Norfolk, etc.—*Gunn.*—(Fl. Oct.) (*v. v.*)

Distrib. South-eastern Australia?

A small, glabrous, depressed species, with a large, woody root, and many short, prostrate stems, 3–5 inches long, with numerous, ascending, short branches. *Leaves* $\frac{1}{6}$–$\frac{1}{3}$ inch long, coriaceous, elliptical or obovate-elliptical, acute or with a mucro. *Flowers* few, on stout, solitary peduncles. *Calyx* six-parted, reddish-green. *Styles* simple, subulate. *Capsule* small, globose, red-brown.

Gen. V. MICRANTHEA, *Desf.*

Flores monoici. Masc. *Calyx* coloratus, 6-phyllus, foliolis imbricatis, 3 interioribus majoribus, petaloideis. *Corolla* 0. *Stamina* 3–6, circa discum glandulosum 3-lobum inserta; *filamentis* liberis; *antheris*

liberis connatisve. Fœm. *Calyx* 6-partitus, laciniis subulatis v. masculo similibus. *Corolla* 0. *Ovarium* 3-loculare, loculis 2-ovulatis; stigmatibus 3, recurvis, robustis, intus stigmatosis, apice bilobis. *Capsula* 3-cocca; coccis stigmatibus persistentibus rostratis, 2-valvibus, 1-spermis.—Suffruticuli; foliis *alternis ternisve, linearibus;* floribus *axillaribus, solitariis, geminis ternisve, breviter pedunculatis.*

I find about eight plants referable to this genus in the Hookerian Herbarium; they are chiefly natives of the southern parts of the continent of Australia, occurring both on the east and west coasts. All appear to be small, somewhat shrubby plants, with very minute flowers, and small, coriaceous leaves. *M. hexandra* is a small shrub, with numerous, erect, leafy branches, and terete, puberulous branchlets.—*Leaves* in threes, linear-obovate or lanceolate, acute or acuminate, $\frac{1}{3}$–$\frac{2}{3}$ inch long, rigidly coriaceous, suberect, quite entire, nerveless, with thickened margins beneath, and a prominent costa. *Flowers* monœcious, axillary, solitary or binate or ternate; peduncles one-flowered, ebracteate, shorter than the leaves. *Calyx* of six spreading pieces, in the male and female flowers alike; three outer pieces narrower, inner imbricate, orbicular. *Stamens* about six, with unequal filaments, dilated into broad connectives; *anthers* adnate, their cells introrse, longitudinally two-valved, the valves waved. *Ovary* oblong, three-lobed, three-celled; cells two-ovuled; the lobes each narrowed into a short, stout, recurved, two-lobed stigma, papillose from the apex to the base on the inner face. *Fruit* an oblong, woody capsule, about $\frac{1}{4}$ inch long, of three cocci, each with a strong, recurved apex, and one seed. *Seeds* narrow-oblong, pale brown, shining, with a large caruncle at the top. *Columna*, to which the cocci are attached, filamentose. (Name from the minute flowers.)

1. **Micranthea hexandra** (Nob. in Lond. Journ. Bot. vi. 283); frutescens, foliis ternis linearibus obovatis oblongis lanceolatisve acuminatis rigidis subtus marginibus incrassatis costaque valida, floribus axillaribus solitariis 2–3-nisve, pedunculis folio brevioribus, staminibus 6. (*Gunn*, 35.)

Hab. Moist, shady ravines, near Launceston, etc., *Scott, Lawrence, Gunn.*—(Fl. Oct.)

Distrib. New South Wales and Victoria.

Gen. VI. PORANTHERA, *Rudge.*

Flores monoici. *Calyx* coloratus, 5-partitus, laciniis imbricatis. *Petala* 5, calyce multo breviora. Masc. *Glandulæ* 5, petalorum basi inserta, carnosæ, bilobæ. *Stamina* 5, circa ovarii rudimentum squamulosum inserta; *filamentis* filiformibus liberis; *antheris* 4-locularibus, poris totidem dehiscentibus. Fœm. *Glandulæ* in annulum 10-lobum connatæ. *Ovarium* 6-costatum, 3-loculare, loculis 2-ovulatis; *stylis* 3, bifidis, lobis subulatis. *Capsula* depresse globosa, verrucosa, 6-costata, 3-cocca; coccis 2-valvibus, 2-spermis. *Seminis* testa carnosa, foveolata, alba.—Fruticuli *v.* herbæ, *ramosissimi, glabri;* foliis *alternis, stipulatis, integerrimis;* floribus *ad apices ramulorum confertis, subracemosis;* pedicellis *bracteatis;* bracteis *inferioribus longioribus, foliaceis, subinvolucrantibus.*

A genus of small, herbaceous, often weedy, prostrate plants, confined to extratropical Australia and Tasmania.—*Stems* often branched in a racemose or subumbellate manner. *Leaves* small, alternate, stipulate, quite entire; the upper forming foliaceous bracts, or surrounding the inflorescence with a kind of involucre. *Flowers* small, white.—*Poranthera microphylla* is a small, glabrous, herbaceous plant, with a woody root, giving off very numerous, spreading, slender, prostrate, ascending branches, 2–6 inches long, simple or di-trichotomously divided. *Leaves* opposite and alternate, with small, membranous stipules, obovate-spathulate or elliptic-lanceolate, acute or acuminate, crowded or fascicled towards the branches, and then often linear, and sometimes uniformly recurved. *Flowers* small, crowded towards the tips of the branches, monœcious. *Calyx* white, of five unequal petaloid lobes. *Petals* five, small, irregular. *Stamens* five, inserted round a rudimentary ovarium; *filaments* free; *anthers* four-celled. *Ovary* globose, six-ribbed, seated on a lobed disc, with three two-lobed styles. *Capsule* membranous, depressed, of three two-seeded cocci. *Seeds* small, brown. (Name from πορος, *a pore*, and ανθηρ; in allusion to the dehiscence of the anthers.)

1. **Poranthera microphylla** (Brongniart in Bot. Voy. Coq. t. 50 A); humilis, glaberrima, ramis e radice perplurimis prostratis gracilibus apicibus ascendentibus, foliis oppositis alternisve petiolatis spathulatis ellipticis lanceolatisve acuminatis versus apices ramulorum confertis, floribus minimis pedicellatis ad apices ramulorum confertis foliis linearibus spathulatisve immixtis.—*Ann. Sc. Nat. ser.* 1. xxix. 385. (*Gunn*, 92.)

Hab. A common little weed everywhere, from the mountain-tops to the sea-coast.—(Fl. Nov.) (*v. v.*)

Distrib. Throughout Australia, both tropical and temperate.

Nat. Ord. LXXIII. URTICEÆ.

The rarity of this Natural Family in the Australian continent is remarkable; nevertheless this country contains one of the most gigantic plants of the Order known, in the *Laportea gigas*, Wedd., a native of the Illawarra district, which attains a height of 140 feet, and girth of 42 at 3 feet above the ground. The Natural Order has lately been ably worked up by Weddell, who enumerates about twelve Australian species, belonging to the genera *Urtica*, *Laportea*, *Elatostemma*, *Pipturus*, *Pouzolsia*, *Parietaria*, and *Australina*; the majority of the above are tropical, or natives of the warmer parts of the New South Wales Colony.

Gen. I. URTICA, *L.*

Flores monoici v. dioici, glomerulati. Masc. *Perianthium* 4-partitum. *Stamina* 4; antheris oblongo-reniformibus, circa pistillum rudimentarium disposita. Fœm. *Perianthium* 4-partitum v. 4-phyllum, segmentis inæqualibus. *Ovarium* rectum, ovoideum; ovulo solitario erecto, stigmate subsessili penicillato. *Achenium* compressum, perigonio inclusum. *Semen* pericarpio conforme; *albumine* parco; cotyledonibus obcordato-rotundatis.—Herbæ *v. rarius* frutices, *glabræ v. pilosæ*, *inermes v. setis pilisve urentibus armatæ*; foliis *alternis v. oppositis*, *inciso-serratis*; stipulis *ovatis linearibusve*; glomerulis *basi bracteolatis*.

Weddell describes forty species of true Nettles known to himself, in his excellent monograph of this Order, most of them natives of the northern hemisphere, though there are also a considerable number of southern species. Only one Australian species is known, which is also found in New Zealand.—Herbs, or rarely shrubs, with opposite or alternate, stipulate, toothed leaves, glabrous or more or less covered with simple or stinging hairs, the latter consisting of a membranous sac, full of acrid fluid, placed on the surface of the leaf, and provided with a tubular seta, which penetrates the skin, and breaking there, introduces the poison into the wound. *Flowers* spiked, in small glomeruli, unisexual, small, green. *Glomerules* bibracteate. *Perianth* generally irregularly four-cleft or four-leaved. *Males* with four stamens, opposite the segments of the perianth, their anthers at first enclosed and held back by the hooded apex of the segment as the flower expands, from which they are finally released by the elastic force of the filament, which becomes bent into an arch, and consists of cells turgid with fluid; the release is very sudden, and causes the discharge of a cloud of pollen. *Female* flowers with a single, erect, flattened, ovate ovary, with a plumose stigma, and one erect ovule. The leaves and other parts of this and many species contain curious bodies lodged in their cells, called cystolithes: these, whose true nature was discovered by Weddell, consist of concretions, formed of concentric layers of a mixture of carbonate of lime and cellulose, at the apex of a pedunele, attached to the inner walls of the cell in which they are found. (See Ann. Sc. Nat. series iv. ii. 267.) (Name from *uro*, to burn.)

1. **Urtica incisa** (Poiret, Encycl. Suppl. iv. 223); herbacea, pilis urentibus armata, foliis oppositis gracile petiolatis polymorphis triangulari-ovatis oblongis linearibus lanceolatisve basi obtusis acutis cordatisve dentatis inciso-serratisve, sinubus acutis, glomerulis racemosis rarius paniculatis, floribus masculis superioribus.—*Wedd. Arch. Mus.* ix. 81. U. lucifuga, *Nob. in Lond. Journ. Bot.* vi. 285; *Fl. N. Zeal.* i. 225. (*Gunn*, 541, 2003.)

Hab. Common in various parts of the Island, Circular Head, Hobarton, King and Flinders' Islands, in Bass' Straits, *Gunn, etc.*—(Fl. Nov.) (*v. v.*)

Distrib. New Zealand.

A tall, but generally slender Nettle, a good deal resembling a common European one in general appearance, but with glabrous leaves. I owe its identification with the plant of Poiret to my friend M. Weddell.—*Stems* erect, nearly glabrous, with a few, long, stinging hairs, which are however more numerous on the petioles. *Stipules* lanceolate or oblong. *Leaves* extremely variable in form and size, from broadly ovate to narrow-linear, membranous, deeply toothed, acuminate, often cordate at the base; petiole 1–3 inches long. *Flowers* clustered on numerous spikes. *Achenia* enclosed in the outer larger leaflets of the perianth, or in other cases the perianth forms a tubular sheath to the achenium.

Gen. II. PARIETARIA, *Tourn.*

Flores polygami, axillares, fasciculati v. cymosi, involucrati. Fl. masc. *Perianthium* 4–5-phyllum. *Stamina* 4–5. Fl. fœm. *Perianthium* tubulosum, ventricosum, 4-fidum. *Ovarium* liberum, perianthio inclusum; stigmate capitulato, sessili v. subsessili.—Herbæ *sæpius diffusæ;* foliis *alternis, exstipulatis.*

A small genus of weedy plants, growing in various parts of the tropics, and warmer latitudes of the globe; many species have been made of its various forms, but these are reduced by M. Weddell to two or three, and amongst them my *P. squalida*, which he has rightly determined to be only a starved state of the ubiquitous *P. debilis*, Forst. *P. debilis* is an excessively variable plant, found in all warm parts of the globe, and is sometimes no larger than *Australina pusilla*, and at others forms a tall, erect, spreading, ramous herb, with an almost woody stem at the base, and leaves 2 inches long. The Tasmanian form is a diffuse, pubescent, starved-looking weed, with numerous, divaricating, slender branches, 6–10 inches long, and small, entire, petioled, membranous leaves, $\frac{1}{4}$–$\frac{1}{2}$ inch long, quite entire, ovate or ovato-rotundate. *Flowers* polygamous, in axillary, clustered, dense-flowered cymes, minute, green, and very inconspicuous, surrounded by a two- to four-leaved involucre, composed of connate bracteolæ. Male with a four-cleft, pilose perianth, and as many stamens. Female broadly ovate or ventricose. *Ovary* compressed, of the same form as the perianth, with a minute, very short, terminal style, and small, brush-like stigma. (Name from *paries*, a wall; in allusion to the usual habitat of the European species.)

1. **Parietaria debilis** (Forst. Prodr. n. 387); floribus paucis axillaribus subsessilibus, involucris 2-4-foliolatis, 1–3-floris.—*Fl. N. Zeal.* i. 226; *Weddell in Ann. Sc. Nat. ser.* iv. *t.* 209. P. Floridana, *Nuttall, Gen. N. Am. Plants,* ii. 208. P. micrantha, *Led. Fl. Alt.* iv. 356. P. appendiculata, *Webb, Phytog. Canariens.* Freyera humifusa, *A. Gay, Fl. Chil.* v. 366, 1031.

Var. *squalida;* depauperata, caule basi lignescente, ramis divaricatis, foliis parvis breve petiolatis late ovatis rotundatisve.—P. squalida, *Nob. in Lond. Journ. Bot.* vi. 285. (*Gunn,* 886.)

Hab. Launceston and Spring Bay, *Gunn.* Var. *β.* Near the sea, on the north coast of the Island; Circular Head and Georgetown, *Gunn.*—(Fl. Oct.)

Distrib. Throughout extratropical Australia, New Zealand, the Himalaya Mountains, and Peninsula of India; Central Asia, Levant, Portugal, the Canary Islands, Madeira, extratropical North and South America.

Gen. III. AUSTRALINA, *Gaud.*

Flores monoici. Masc. axillares, ad apicem pedunculi elongati solitarii v. bini. *Perianthium* v. involucellum cochleare. *Stamen* 1. Fl. fœm. axillares, subsessiles, solitarii v. 2–3. *Perianthium* lagenæforme, compressum, achenium amplectens, ore minimo; *stylo* elongato exserto.—Herbæ *tenellæ, prostratæ v. suberectæ;* foliis ***alternis, stipulatis v. exstipulatis, grosse crenatis dentatisve.***

This curious little genus consists of a very few South African, Abyssinian, Australian, and New Zealand plants. The Tasmanian *A. pusilla* is a small, loosely tufted, deep green, membranous herb, growing in shady places, with slender, prostrate, creeping, slender stems, 3–6 inches long, pubescent with reflexed hairs. *Leaves* petioled, about ¼ inch broad, rounded or rounded-ovate, with a few broad blunt crenatures. *Male flowers* terminating short decurved axillary peduncles, usually solitary, consisting of a minute, broad, shallow, concave, pilose, bilobed perianth, containing a comparatively long stamen. *Female flowers* minute, axillary, very shortly pedicelled, consisting of an extremely compressed elliptic perianth, with a linear-oblong bract at its base, minute mouth, and ciliated margins. *Pistil* stipitate, its style and stigma exserted. The New Zealand *A. Novæ-Zelandiæ*, which I had distinguished by its smaller bract to the female flower (which is sometimes bractless), is, I am now disposed to think, only a variety of *A. pusilla*. (Name from having been discovered in Australia.)

1. **Australina pusilla** (Gaud. Bot. Voy. Uran. 305, et in Voy. Bonite, t. cxiv. A); pusilla, caulibus retrorsum puberulis, foliis minimis rotundato-ovatis grosse crenatis, perianthio masc. bilobo; fl. ♀ bracteola oblonga lineari.—*Weddell in Ann. Sc. Nat. ser.* 4. i. 212. A. Tasmanica, *Nob. MSS. in Fl. N. Zeal.* i. 226. A. Novæ-Zelandiæ, *Nob. in Fl. N. Zeal.* i. 226. Urtica pusilla, *Poir. Encycl.* iv. 224. (*Gunn*, 887.)

Hab. Circular Head and banks of the Acheron, *Gunn*.—(Fl. Dec.)

Distrib. South-eastern Australia and New Zealand.

Nat. Ord. LXXIV. CUPULIFERÆ.

The total absence of any of the prevalent genera of this Order, except *Fagus*, in the temperate regions of the Southern hemisphere, is in some respects a remarkable anomaly in geographical distribution, for there are few or no Natural Families of equal extent in number of genera and species, and that range as this does from the subarctic regions to the level of the sea under the Equator, that are not continued into the south temperate continents. The range of the only very large genus of the Order, *Quercus*, has been only recently approximately known, and its extension in great abundance into the hot humid regions of the Malayan Peninsula and Archipelago demonstrated. It however scarcely crosses the Equator in the Old World, nor does it in the American continent, where it is no less abundant in the northern tropics, but there almost exclusively inhabits the cooler mountainous regions of the Cordillera. In Africa, again, the *Cupuliferæ* are found nowhere south of Algeria, where they are rare.

Under these circumstances, the reappearance of the northern genus *Fagus* in the mountains of South Chili and Fuegia, New Zealand and Tasmania, and not in the Cordillera of Peru, the Australian Alps, or anywhere within 40° of the Equator, either in the north or south hemispheres, is an extraordinary fact. Again, the close similarity between the Beeches of the southern hemisphere, their marked dissimilarity from those of the northern hemisphere, their being confined to the alpine or colder regions of the three most southern masses of land in the globe, are amongst the strongest proofs of there being a closer botanical relationship between these lands than those to the northward of them respectively present. The evergreen *Fagus Cunninghamii*, Hook., is strictly the representative of the *F. Menziesii*, H.f., of the New Zealand Alps, and of *F. betuloides*, Mirb., of Fuegia; whilst the deciduous-leaved *F. Gunnii*, H.f., is in like manner the representative of *F. Antarctica* of Fuegia, but has no analogue in New Zealand; for it is a curious fact, that whereas deciduous-leaved Beeches are the most alpine trees in Fuegia and Tasmania (as shrubs however), and advance furthest towards the South Polar regions of all arboreous vegetation, to Cape Horn, in lat. 56° S., nothing of the sort is found in New Zealand or the islands to the south of that Archipelago. It is in the investigation of such facts that we seek a clue to guide us to a knowledge of the great problem of the distribution of southern plants.

Gen. I. FAGUS, *L.*

Flores monoici. Masc. *Perianthium* campanulatum, 5–6-fidum. *Stamina* 8–12, circa discum glandulosum inserta; antheris bilocularibus, connectivo excurrente. Fœm. *Flores* 2–4, involucro urceolato 4-lobo extus bracteis adnatis instructo sessiles. *Perianthium* urceolatum, tubo cum ovario adnato, ore laciniato. *Ovarium* inferum, sessile, 3-loculare; *stylis* 3, filiformibus, exsertis; *ovulis* loculis solitariis, e apice loculi pendulis, anatropis. *Fructus* capsulæformis. *Nuculæ* 2–4, involucro lignoso 4-valvi extus lamellato v. echinato inclusæ, triquetræ, perigonii limbo piloso superatæ, monospermæ; epicarpio coriaceo, endocarpio villoso. *Semen* pendulum; testa membranacea, tenui; embryone exalbuminoso, orthotropo; cotyledonibus crassis, carnosis, intus plicatis, arcte cohærentibus; radicula subexserta, supera.—Arbores *v.* frutices, *gemmis perulatis;* foliis *alternis, serratis, coriaceis sempervirentibus vel membranaceis plicatis et deciduis;* floribus *coætaneis.*

Dissimilar as they appear at first sight, the genera Oak, Chesnut, and Beech are very closely allied indeed, and in their female flowers almost identical, *Fagus* alone differing materially from its allies in having a well-marked perianth to the male flowers, and in these not being arranged in catkins.—Monœcious, evergreen or deciduous trees or shrubs, with scaly buds, and alternate, crenate or serrate, simple, generally unequal-sided leaves. *Male flowers* of eight to twelve stamens, seated round a glandular disc, occupying the centre of a bell-shaped or cup-shaped five- or six-lobed perianth. *Female flowers* generally in threes, sessile in a four-lobed, coriaceous or woody involucre, whose lobes are externally lamellated transversely or spinulose with adherent bracts. Each female flower consists of a small urceolate perianth, whose large tube is adherent to a three-celled ovary, and limb generally silky and laciniate. *Styles* three, exserted. *Ovules* solitary in each cell, pendulous. As the fruit ripens, each flower assumes the appearance of a triquetrous nut, containing one exalbuminous seed, surrounded by a membranous testa, and that again by the coriaceous brown perianth adnate with the proper pericarp; the two other cells, with their ovules, being obliterated. *Cotyledons* firm, fleshy, often plaited internally, more or less connate; radicle superior. (Name, φηγος in Greek, from φαγω, *to eat.*)

1. **Fagus Cunninghamii** (Hook. Journ. Bot. vii. anno 1840, 152, t. 7); foliis sempervirentibus crasse coriaceis rhombeis ovato-deltoideis grosse inæqualiter crenato-dentatis basi cuneatis cordatisve junioribus non plicatis, involucri laciniis 4 oblongo-lanceolatis spinis mollibus apice incrassatis seriebus transversis instructis. (*Gunn*, 178.)

Hab. Common, especially in mountainous and western humid districts, forming a large proportion of the forest, and ascending to 4000 feet as a shrub. (Colonial name, "Myrtle-tree.")

Distrib. Wilson's Promontory, Victoria, *Mueller.*

This well-known tree, though so common in Tasmania, appears to be extremely rare on the Australian coast, and confined (?) to the locality where gathered by Mueller. It is readily distinguished from the following by its coriaceous, evergreen leaves, as well as by its size, etc. In Tasmania, Gunn says that it forms the principal tree in fully one-half of the forests, growing mixed with *Eucalyptus* and *Atherosperma;* its shade is so dense that no grass grows under it, the surface of the ground being covered with Mosses, Hepaticæ, Ferns, and Fungi. Even animals and birds are rare, except flocks of the Black Cockatoo, which feed on the grubs contained in the decaying trees. It often attains 40 feet in girth, and 200 in height, yielding an excellent timber.

2. **Fagus Gunnii** (Nob. in Hook. Ic. Plant. t. 881); fruticosa, prostrata v. suberecta, ramulis foliisque subtus secus nervos pilosis, foliis deciduis membranaceis, junioribus plicatis, brevissime petiolatis late ovato-rotundatis basi subobliquis obtusis emarginatisve crenato-serratis, stipulis subulatis basi gibboso-inflatis, involucri laciniis 4 linearibus integris dorso simplici serie lamellatis lamellis sinuato-crenatis, nucibus late 3-alatis. (*Gunn*, 2034).

Hab. Summit of Mount Olympus, and mountains near Macquarrie Harbour, elev. 4–5000 feet, *Gunn*, *Milligan*. (Fl. Jan.)

This curious species forms a small dense bush, often covering the ground with an impenetrable scrub 5–8 feet high, but would probably become a tree in favourable localities; it is readily distinguished from *F. Cunninghamii* by its size and deciduous leaves, which are plicate in vernation.

Nat. Ord. LXXV. CASUARINEÆ.

Gen. I. CASUARINA, *Rumph.*

Flores dioici v. monoici. Masc. *Amenta* terminalia, gracilia, floribus in axillis vaginarum verticillatis. *Perianthium* 2-phyllum, bibracteolatum, foliolis apice calyptratim cohærentibus. *Stamen* 1; filamento filiformi, innato; anthera biloculari. Fœm. *Amenta* ramulis brevibus lateralibus breviter stipitata, globosa. *Ovarium* lenticulare, in axilla bracteæ persistentis sessile, bracteolis 2 navicularibus primum inclusis; perianthio 0; stylo brevissimo terminali, stigmatibus 2 elongatis filiformibus; ovulis 2, collateralibus, supra basin loculi affixis, semi-anatropis. *Strobilus* lignosus, oblongus v. breviter cylindraceus, e bracteis bracteolisque lignescentibus connatis formatus. *Caryopsis* compressa, apice alata, primum bracteolis capsulam bivalvem mentientibus inclusa, demum iisdem apertis nudata; pericarpio vasibus spiralibus farcto. *Semen* 1, erectum, funiculo medio seminis lateraliter inserto, cum ovulo abortivo suffulto; testa membranacea. *Embryo* exalbuminosus; *cotyledonibus* magnis oblongis compressis; *radicula* minima, supera.—Frutices v. arbores, *ramis ramulisque verticillatis, nodoso-articulatis, sulcatis*; articulis *vaginatis*; vaginis *sulcatis, ore in folia squamæformia subulata desinente*; foliis *primariis oppositis, squamæformibus, cæteris in vaginam connatis.*

Of this very remarkable genus, the only one of its Order, I have seen about twenty-five Australian species, together with a few Polynesian and Malayan Island ones: of the latter, one is found as far north as Arracan, on the Malayan peninsula, and is cultivated all over India, and in many parts of Africa and its islands. Though very different in habit from every other Order, this is related to the *Betulaceæ* (Birch and Alder) and *Myriceæ*, differing from these, and indeed from almost all Dicotyledonous plants, in their leaves being whorled, and united by their margins into sheathing joints, like those of *Equisetum*. The Australian species are found on all the coasts, but more abundantly in the south-western quarter.—*Shrubs* or trees, with whorled branches, and branches that are cylindrical, striated, and jointed, each joint bearing at its summit a short toothed sheath, composed of minute, connate leaves, which are elongate and recurved in the terminal shoots of some species; these are thrown off as the wood matures, and the latter becomes striated in the branches. *Flowers* monœcious or diœcious, the males in slender terminal catkins, formed of shortened joints, in the sheaths of which the flowers appear; these are generally equal in number to the teeth of the sheath, and consist of one stamen, with two bractlets and as many perianth-leaves at its base; these perianth-leaves cohere in a calyptrate manner over the anther, which carries them up as its filament elongates, and finally carries them out of the sheath of leaves. *Female flowers* extremely densely crowded, in small, globose, lateral capitula, which are covered with their long stigmas: when young, each flower is found to consist of an excessively minute ovary, with two filiform stigmas, enclosed between two bracteolæ, which again have a bract placed outside them; the ovary contains two ovules, and ripens into a flat black caryopsis, winged at the apex; during ripening the lateral bracts cohere into woody two-valved capsules, of which the ripe strobilus is formed. *Pericarp* winged, full of matted spiral vessels. *Embryo* exalbuminous, with large, flattish cotyledons, and a superior radicle. (Name said to be from the resemblance of the pensile branchlets to the feathers of the Cassowary.)

1. **Casuarina quadrivalvis** (Lab. Pl. Nov. Holl. ii. 67. t. 218); ramulis pendulis elongatis tereti-

bus 9–12-striatis, striis verruculosis sulcis puberulis, vaginarum dentibus lanceolatis ciliolatis erectis, amentis masculis 10–30-articulatis, vaginis campanulatis, strobilis breviter pedunculatis breviter elliptico-oblongis 17–18-stichis, bracteolis porrectis acutis pungentibus.—*Miq. Revis. Crit. Cas.* 71. *t.* ix. C. (*Gunn*, 736.)

Var. *spectabilis* (Miq. l. c. 73. t. x. C); humilis, ramulis robustis, sulcis latiusculis tomentellis, amentis masculis crassioribus. C. Gunnii, *Nob. MSS.; Miq. in Ned. Kruidk. Archief*, iv. 100. (*Gunn*, 1247.)

Hab. Abundant in good light soil in stony places throughout the Island, except towards the north-west. Colonial name, "She-Oak."—(Fl. Oct.) (*v. v.*) Var. *spectabilis* forming dense small thickets near Georgetown and on Flinders' Island, *Gunn*.

Distrib. South-eastern Australia, from subtropical New South Wales to Victoria.

A very common small tree, 20 feet high, with pendulous, slender branches, that have an acid taste; its wood is used for firewood, and will burn even when green. It differs from the other Tasmanian species in its more robust male inflorescence, more numerous striæ to the branchlets, and corresponding teeth of the sheath and flowers in each whorl, which vary from nine to twelve, and especially in the ripe cone, which is an inch long, shortly elliptic-oblong, with projecting, acuminate, ovate, pungent tips to the bracts which enclose the cavities containing the caryopses; these bracts are close-set, and leave no flattened surface between their backs, which are smooth, pale-brown, and keeled. Gunn is doubtful whether the var. *spectabilis* is not a distinct species; Miquel first placed it under *quadrivalvis*, but has since published it as different; I find no character but its robust habit to distinguish it, and Victoria specimens are quite intermediate in this respect.

2. **Casuarina distyla** (Vent. Plant. Nouv. 62); humilis, ramulis strictis 6–9-angulatis, angulis obtusis, sulcis medio glabris puberulisve, vaginarum dentibus lanceolatis ciliolatis, amentis masculis 10–20-articulatis, strobilis subsessilibus oblongo-cylindraceis sub-14-stichis, bracteis breviter ovatis acutis irregulariter subtuberculatis.

Var. *a*; internodiis 6–7-sulcatis.—C. distyla, *Miq. Revis. Cas.* 57. *t.* vii. A, C. (*Gunn*, 735.)

Var. *β. rigida*; internodiis longioribus 7–9-sulcatis.—C. rigida, *Miq. l. c. t.* vii. P. (*Gunn*, 735 *et* 735 ?)

Hab. Common throughout the Colony, ascending to 4000 feet.—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales and Victoria.

Miquel, in his valuable revision of *Casuarina*, has separated Gunn's 735 into two species, as *C. distyla* and *C. rigida*, differing in *C. rigida* having usually seven or eight instead of six or seven angles on the branchlets. It is a very common small bush, especially abundant near the sea, where it forms low thickets 2–5 feet high, and is distinguished by its straight erect branchlets from *C. quadrivalvis*, also by its more oblong cone, with less prominent bracts, which are less acuminate and pungent, and more or less tubercled or uneven on the back.

3. **Casuarina suberosa** (Otto et Dietr. Allgem. Gartenzeit. 1841, 155); erecta, arborea, ramulis strictis gracilibus 6–8-angulatis, angulis obtusis, sulcis medio glabris puberulisve, vaginarum dentibus lanceolatis ciliolatis, amentis masculis 10–20-articulatis, strobilis subsessilibus oblongo-cylindraceis sub-14-stichis, bracteis breviter ovatis acutis irregulariter subtuberculatis.—*Miq. Revis. Crit. Cas.* 54. t. vi. B. (Tab. XCVI.) (*Gunn*, 544.)—*An var.* C. distylæ?

Hab. Common on stony hills.—(Fl. Oct.) (*v. v.*)

Distrib. New South Wales and Victoria.

This is an erect species, growing 15 feet high, and is probably the normal state of the species of which *C. distyla* is a variety. It is well known as the "He-Oak," in contradistinction to the *C. quadrivalvis*, or "She-Oak," a name, I believe, adapted from the North American "Sheack:" though more nearly allied botanically to the Northern Oaks than any Tasmanian genus except *Fagus*, they have nothing to do with that genus in habit or appearance, nor with the Canadian "Sheack." Gunn says of this that he does not know how it can be distinguished

from *C. distyla*, except by the stature and slenderer branchlets. I find however as slender branchlets in *C. distyla*, and I fear that the stature of all the species affords a very fallacious character. Miquel distinguishes this mainly by having more slender branches.—PLATE XCVI. *A*, male, and *B*, female plants; *C*, female cones. 1, part of male catkin; 2, bud of male flower; 3, the same, expanded; 4 and 5, bracts; 6, scale of the perianth; 7, transverse section of anther; 8, pollen; 9, tissue of anther; 10, diagram of male flower and bracts; 11, female capitulum; 12, the same, with lower scales and flowers removed; 13, portion of rachis, with scales, bracts, and flowers; 14, outer bract; 15, inner bracts and flower; 16, ripe caryopsis; 17, the same, laid open, showing the web of spiral tissue in the walls of the pericarp, an immature seed and ovule; 18, mature seed and ovule; 19, imperfect ovule; 20, seed, opened, showing the embryo; 21, embryo; 22, spiral tissue; 23, germinating plant (*a*, remains of pericarp); 24, cotyledons, leaves, branch, etc.; 25, diagram of germinal leaves:—*all but figs.* 11 ***and* 23 *very highly magnified.***

NAT. ORD. LXXVI. CONIFERÆ.

The distribution of the plants of this Family in the southern hemisphere is in many respects exceedingly curious. In all parts of the globe they affect mountain localities in preference to plains, and cool climates rather than hot; for though some few species, growing socially, cover enormous level areas in the north temperate zone, none do so in the tropics or south temperate zone, and the genera and species are always far more varied in rather elevated regions. The cool, damp, hilly surface of Tasmania might therefore be expected to possess a far greater variety of *Coniferæ* than any equal area at a lower level in Australia, and so it does; but, on the other hand, the individual species are so local, and present so few individuals, that I believe the island may be crossed from north to south without a single species of the Order being met with.

There are in Australia, including Tasmania, about thirty species of *Coniferæ*, of which nine are peculiar to Tasmania, one common to its mountains and the alps of Victoria, and another to the lower regions of both countries. Only five or six species have been found in the south-west quarter, and one or two in the tropics. These thirty species belong to eleven genera, of which six are peculiar to Australia and Tasmania, four of them being confined to Tasmania itself. The genera which are not peculiar are *Podocarpus*, found in the tropics and south temperate regions of Asia and America, in the southern latitudes of Africa, and in China and Japan; *Dacrydium*, which is chiefly a New Zealand genus, but has species in Eastern India and the Malay Archipelago; *Araucaria*, of which there are two subtropical New South Wales species, and others in Norfolk Island, New Caledonia, the New Hebrides, Chili, and Brazil; *Phyllocladus*, of which two species inhabit New Zealand, and one the lofty mountain of Kini Balou, in Borneo; and *Dammara*, which occurs also in New Zealand, New Caledonia, and the Moluccas.

The Australian *Coniferæ* are generally referred to three Suborders of that Natural Family: they are, CUPRESSINEÆ, containing *Frenela*, *Octocline*, and *Diselma*; ABIETINEÆ, to which the *Araucariæ* belong, together with *Athrotaxis*; and PODOCARPEÆ, including *Dacrydium*, *Microcachrys*, *Podocarpus*, and *Phyllocladus*. The above however are artificial divisions, founded chiefly upon the nature of the scales of the cones; a more natural one is that proposed by Brown and Bennett (Plant. Javan. Rariores, p. 37), and founded on the form of the pollen-grains, which are spheroidal in CUPRESSINEÆ (including *Frenela*, *Octocline*, *Diselma*, and *Athrotaxis*), and curved or of an irregular figure in ABIETINEÆ (including *Podocarpus*, *Dacrydium*, *Phyllocladus*, *Pherosphæra*, and *Microcachrys*).

The structure and morphology of the flowers of the genera of this Order present many great difficulties, which were first overcome by Mr. Brown; and as it is impossible to understand the nature of the parts of any one species without a detailed examination and study of many, I shall endeavour in a few words to

give a connected sketch of the prominent characters of the Tasmanian genera. All are shrubs or trees, with the stems and branches formed on the same plan as in other Dicotyledonous plants, but differing from the majority of these in the rarity of medullary rays, in the highly organized structure of the tubes of the wood, which are studded internally with beautifully formed discoid glands; and they also germinate as other Dicotyledons, being exorhizal, but sometimes have three or more cotyledons to the embryo, or, as some consider, normally two cotyledons, but each divided congenitally to the base into two or more equal lobes. Their foliage presents many curious forms, and seldom resembles that of other trees, most so however in *Podocarpus*, and least so in *Phyllocladus* and *Frenela*.

Both male and female flowers are deprived of a perianth; the males consist of single stamens collected in small cones; and, from the uniformity of the tissue of all its parts, it would seem that each stamen consists wholly of an anther, whose often very beautifully constructed and highly developed connective is narrowed below into a short stipes (not a proper filament), and dilated above into a broad peltate scale, bearing cells on its margin: the pollen I have already alluded to; the grains of the curved form in some European species present a unique development, the pollen-tube emitted on fecundation originating in a free cell-formation within the middle of the curved part of each pollen-cell.

The female flowers essentially consist of an ovule, with no investing ovary, seated upon a scale, called the ovuliferous scale, which is an open rudimentary ovary; these scales are solitary in *Podocarpus*, spiked in *Dacrydium* and *Pherosphæra*, capitate in *Phyllocladus*, two and opposite in *Diselma*, whorled in *Frenela*, imbricate and forming a cone in *Microcachrys* and *Athrotaxis*. In some genera these scales bearing the ovules are subtended by a more or less free or adnate bract (obviously in the northern Pines); this bract is seen distinctly in some *Frenelas* and in *Athrotaxis selaginoides* to be adnate to the back of the ovuliferous scales, and to form a beak to them; whereas in *A. laxifolia* and *A. selaginoides* it appears larger and broader than the ovuliferous scale, which is, as it were, adnate to its inner face. The ovuliferous scales are persistent in all the Tasmanian genera but *Pherosphæra*, in which the ripe seed and scale together fall away from the rachis of the spike; in *Podocarpus* the seed, scale, and spike fall away together; in all the other genera the seeds fall away from the ovuliferous scale.

The ovules are always orthotropous; they are solitary on each ovuliferous scale in *Podocarpus*, *Phyllocladus*, *Dacrydium*, *Pherosphæra*, and *Microcachrys*; there are two on each scale in *Diselma*; several in *Frenela* and *Athrotaxis*: they are erect, pointing upwards, in *Pherosphæra*, *Diselma*, and *Frenela*; inverted, pointing downwards, in all the rest; but in *Microcachrys*, *Dacrydium*, and *Phyllocladus* they become partially or wholly erect as they ripen: they are free, or inserted by a small base, in all the genera but *Podocarpus*, in which the outer coat of the ovule (and seed) is adnate throughout its length to the ovuliferous scale. The ovule consists of one or rarely two rather coriaceous coats, and an enclosed nucleus, but in *Dacrydium* and *Phyllocladus*, which have two, the outer coat covers the ovule in a very young state only, forming a short sheath or incomplete annulus round the base of the ovule, at the period of impregnation and afterwards; a third coat appears investing the immature nucleus in some species (as in *Microcachrys*), whose exact nature I have not determined, but it probably belongs to the nucleus. In some genera (*Athrotaxis* and *Diselma*) the outer coat is contracted at its apex into a tube; in others it forms an expanded, fimbriated mouth, which, after impregnation, becomes introverted.

No account of the structure of the nucleus of the ovule of the Tasmanian species has hitherto been published, but it no doubt shares the peculiarities of the better-known plants of this Order, and is assumed to consist of a fleshy, conical body, containing an embryo-sac. After the pollen has fallen on the mouth of the ovule, it sends a tube, by a very slow process of growth, into the substance of the nucleus; the embryo-sac thereupon becomes filled with cellular albumen; after this, several cells (called secondary em-

bryo-sacs by some, and corpuscles by others), towards the micropylar end of the cellular contents of the embryo-sac, enlarge, and free cells form within them. After this the pollen-tube again elongates, piercing the tissue of the nucleus, and reaches the embryo-sac, opposite to a corpuscle; it then pierces the embryo-sac itself, and, passing down between the cell interposed between the corpuscle and wall of the sac, finally reaches the latter: this is the period of actual fecundation, for then a cell (embryonal vesicle) in the corpuscle begins to develope an embryo within itself, or sometimes four embryos within itself, of which only one usually comes to perfection. This is only a sketch of a very complicated process, whose stages it is most important that the Tasmanian microscopists should investigate in the Conifers of their island. There are several accessory points to which attention should be directed, such as the development of the pollen-tube itself, a complicated process in some Conifers; the peculiar development of the cells between the corpuscles and walls of the embryo-sac, which form a sort of ring or tube over the latter, down which the pollen-tube proceeds; and finally, the development of four suspensors, each terminated by an embryo, from a cell within the embryonal vesicle. The above is a *résumé* of the discoveries of Brown, Mirbel, Spach, and Hoffmeister, to whose labours I must refer the structural botanist who would pursue the investigation.

Supposing the evolution of the embryo to be preceded by these complicated processes in *Coniferæ*, and accepted as an established fact, of which there seems to be no doubt, it is not easy to compare the process with that of other Phænogams, in which the embryo-sac of the nucleus contains embryonal vesicles, from which single embryos are at once developed; nor to determine what are the homologues of the corpuscles, which latter indeed seem to take the place of embryo-sacs.

One of the most striking phenomena accompanying this development, is the great length of time consumed: in many Conifers the growth of the pollen-tube takes months, and the ripening of the seed two or more years; and hence it is that we often find seeds of *Coniferæ* to be hard, and full of well-formed albumen, but with only rudimentary traces of the embryo, which is however not hence necessarily abortive, but only undeveloped.

The following is a clavis of the Tasmanian genera:—

1. Frenela.—*Fruit* large, lateral, of six woody valves, with many erect, compressed, imbricate seeds. *Leaves* minute scales, whorled in threes.
2. Diselma.—*Fruit* small, terminal, of four minute erect scales, with two erect seeds at the base of the two inner scales. *Leaves* minute, coriaceous, densely imbricated on the tetragonous branchlets.
3. Athrotaxis.—*Fruit* a terminal, globose cone, with almost woody, peltate scales, each bearing three to six inverted seeds. *Leaves* densely imbricate, coriaceous.
4. Pherosphæra.—*Fruit* a small, terminal spike of deciduous scales, each bearing one inverted ovule, which, as it ripens, becomes an erect, small seed. *Leaves* minute, densely imbricated and appressed.
5. Podocarpus.—*Fruit* a solitary, terminal, inverted, fleshy seed, cohering with the scale, which forms a ridge on one side of it; seated on a fleshy peduncle. *Leaves* scattered, flat, spreading, linear.
6. Dacrydium.—*Fruit* a small, terminal, curved spike (an imperfect cone), of a few scales, each bearing an inverted ovule. *Leaves* minute, densely imbricated and appressed.
7. Microcachrys.—*Fruit* a small, terminal, ovoid cone, of many, imbricating, short, concave scales, each containing one inverted ovule, which, as it ripens, becomes a subercet seed. *Leaves* minute, densely quadrifariously imbricated and appressed.
8. Phyllocladus.—*Fruit* a few scales aggregated together, each bearing one inverted ovule, which, as it ripens, becomes an erect seed. *Leaves* (phyllodia) flat, cuneate or flabellate.

Gen. I. FRENELA, *Mirb.*

Flores monoici. Masc. *Amenta* terminalia, cylindrica. *Stamina* numerosa, in axi sexfariam imbri-

cata; *filamentis* brevissimis, in connectivi processum peltatum productis; *antheris* 2–4, horizontalibus, longitudinaliter bivalvibus. *Pollen* sphæricum. Fœm. *Amenta* solitaria v. conferta. *Squamæ* (ovaria) 6, circa axin verticillatæ, alternæ angustiores, primum patentes, dein valvatim clausæ. *Ovula* ad basin squamarum pluriseriata, imbricata, lagenæformia, erecta, micropylo breviter porrecto. *Strobilus* ovatus v. subglobosus; valvis 6, lignosis, dorso convexis, erecto-patentibus. *Semina* plurima, valvis breviora, compressa; testa subossea, utrinque alata. *Embryo* in axi albuminis carnosi antitropus, ejusdem longitudine; *cotyledonibus* 2–3; *radicula* supera.—Arbores *v.* frutices *resinosi;* ramulis *tenuibus, cylindricis triedrisve;* foliis *ternatim verticillatis, squamæformibus, ramulis adnato-decurrentibus, eglandulosis;* strobilis *lignosis, secundo anno maturatis.*

The Australian *Frenelæ* represent the *Juniperi* and *Cupressi* of the northern hemisphere, and still more closely the genus *Callitris* of South Africa, and *Pachylepis* of North Africa, which differs chiefly in having only four scales to the cone. About fifteen Australian species are known, which are spread over all parts of that continent; none are found elsewhere.—Evergreen shrubs or trees, some of which bear in the young state acicular leaves, but all of which, when fully developed, have minute leaves, whorled in threes, and adnate with the branch for the greater part of their length. *Flowers* monœcious; the *males* consist of minute terminal catkins, of imbricating, peltate stamens, bearing on their stipes three or four small anthers, full of globose pollen. *Female* flower a small, six-scaled amentum, with many erect ovules at the base of each scale. *Fruit*, or ripe cone, woody, of six spreading sessile scales, the three alternate smaller. *Seeds* winged, compressed. *Embryo* with three cotyledons. (Named in honour of *M. Frenel*, an eminent French natural philosopher.)

1. **Frenela rhomboidea** (Endl. Synops. Conif. 36); fruticosa, ramulis subacute triquetris, strobilis confertis subglobosis, valvis obtusis dorso infra apicem gibbere conico apice mucronato v. lævi lævibus v. rugulosis intus tuberculatis columna centrali tricruri, seminibus anguste v. late alatis osseis.—Callitris rhomboidea, *Br. MSS. Rich. Conif.* 47. *t.* 18. *n.* 1. C. Australis, *Nob. Lond. Journ. Bot.* iv. 147, *non Br.* (*Gunn*, 543, 1017.)

Hab. Spring Bay, Oyster Bay, and other localities on the east coast, *Backhouse;* abundant on granite soil by the sea-coast, Flinders' Island, *Gunn.*—(Fl. Oct.) (Colonial name, "Oyster Bay Pine.")

Distrib. South-eastern Australia, New South Wales, and Victoria. (Cultivated in England.)

Backhouse describes this as a tree 50–70 feet high and 6–9 in girth, of a pyramidal shape, and giving a peculiar feature to the landscape; but Gunn gives it only 25 to 30 feet, and a diameter of 1, whilst at Flinders' Island it appears to be only 10–12 feet high, and forms dense thickets. Like many other Conifers, it probably varies extremely in stature.—Wood of little use, said to be obnoxious to bugs, from its resinous odour. *Branches* drooping (sometimes erect?), slender; the branchlets acutely three-angled, from the prominent keels of the adnate leaves. *Male* cones very small, about 1 line long. Ripe *female cones* sessile, about as large as a hazel-nut, of six unequal, woody, thick scales, the alternate ones half as large as the others, all produced at the back into a blunt gibbosity, that sometimes bears a sharp mucro. *Seeds* imbricated round a depressed, central, three-ridged axis.

2. **Frenela australis** (Br., Endl. Synops. Conif. 38); strobilis ovatis, valvis muticis v. dorso infra apicem mucronulatis linearibus, extus planiusculis v. convexis lævibus v. rugosis, intus vix tuberculatis, alternis minoribus, columna centrali brevi v. obsoleta, seminibus late ovatis, testa ossea, alis plerumque brevissimis.—Callitris Gunnii, *Nob. in Lond. Journ. Bot.* iv. 147. ? C. oblonga, *Rich. Mem. Conif.* 49. *t.* 18. *n.* 2. (*Gunn*, 542.) (Tab. XCVII.)

Hab. Abundant upon gravelly banks of the South Esk River, near Launceston, etc.—(Fl. Nov.) (Colonial name, "Native Cypress.")

Very nearly allied to *F. rhomboidea*, but with branches always erect, and larger, ovate cones, whose scales have not the dorsal gibbosity of that plant, and are generally less convex on the back, and sharper at the apex. The

scales have often a small mucro below the apex, but this is sometimes wholly wanting. The seeds are narrower, less winged, and have a narrower border. This forms a bush or small tree 10–25 feet high, and is variable in the form and size of the cones.—PLATE XCVII. *A*, male; *B*, female plant in fruit; *C*, another form of fruit: 1, branch and leaves; 2, male cones; 3 and 4, stamens with three, and 5, with two anthers; 6 and 7, pollen; 8, female flower; 9, scale from ditto, with ovules; 10, section of ripe cone; 11 and 12, seeds; 13, vertical section of seed; 14, ditto of nucleus, embryo, and albumen; 15, embryo; 16, germinating plant:—*all but fig.* 16 *highly magnified.*

Frenela triquetra, Spach, is said by Miquel (Stirp. Nov.-Holl. a F. Mueller collectas determinavit F. A. G. Miquel, in Ned. Kruid. Arch.) to have been found in Tasmania by Mr. Stuart, but I have seen no specimens.

Gen. II. DISELMA, *Hook. fil.*

Flores dioici. *Ament. masc.* parva, sessilia, terminalia. *Stamina* 6–8, axi imbricata, stipite brevissimo; antheræ connectivo brevissimo triangulari coriaceo, loculis 2 divaricatis multoties minore. *Pollen* sphæricum. *Ament. fœm.* parva, terminalia, axi in centro amenti cylindraceo, erecto. *Squamæ* 4, coriaceæ, 2 exterioribus brevioribus vacuis, 2 interioribus erectis orbiculatis 2-ovulatis. *Ovula* erecta. *Strobilus* erectus; squamis rigidis, erectis; seminibus tripteris, erectis, squamis longioribus, late ampullaceis, ore contracto tubuloso.—Frutex *erectus, ramosissimus;* ramis ramulis*que tetragonis, foliis densissime quadrifariam imbricatis obtectis, ultimis divaricatis;* foliis *ramulis arcte appressis, late rhombeo-triangularibus, obtusis;* amentis *masculis vix* 1½ *lin. longis, ramulis angustioribus;* ament. fœm. *erectis, subglobosis, vix* 1 *lin. diametro.*

1. **Diselma Archeri** (Hook. fil.).—Microcachrys tetragona, *Archer in Hook. Journ. Bot.* ii. 51, *non mihi, nec* Athrotaxis tetragona, *Hook. Ic. Pl.* 560. (*Gunn*, 366.) (TAB. XCVIII.)

HAB. Lake St. Clair, Falls of the Meander, etc., ascending the Western Mountains and Mount Olympus (elev. 4500 feet) to their summits.—(Fl. Jan.) (Cultivated in England.)

So exceedingly similar to *Microcachrys tetragona*, that Gunn (who sends this for that plant, though with a different number) says that, except by their different habit, he does not know how they are to be distinguished: their male and female cones are however extremely dissimilar. The *Diselma* always grows erect, from 5–15 feet high, with a stem sometimes 16 inches in diameter; the trunk exudes much resin. *Male cones* very small, terminal and oblong, hardly broader than the branchlet, with a few (six to eight) stamens, which have a very small, broad, triangular, not ciliated, coriaceous termination to the connectivum, and two very large, diverging cells. The *female cones* are small and terminal, and consist of four scales in opposite pairs: the outer, smaller, bear no ovules; the inner each bear two erect ovules at their bases. When fully formed, these cones are still scarcely a line across; the scales are erect, and shorter than the seeds; these I have only seen unripe, they are broad, compressed, three-winged, with a narrow, tubular, contracted mouth.—This genus is closely allied to *Thuja*, *Libocedrus*, *Frenela*, and their allies, but abundantly distinguished by habit and characters from all. (Name from δις, *two*, and σελμα, *a standard;* in allusion to the two ovuliferous scales.)—PLATE XCVIII. *A*, male, and *B*, female plants; 1 and 2, leaves; 3, male cone; 4 and 5, stamens; 6, pollen, *a*, dry; *b*, in oil; (from Mr. Archer's drawings); 7 and 8, female cones; 9, cone, with the bract spread open; 10, bract and ovules; 11, cone of fully-formed seeds; 12, seed; 13, vertical section of ditto:—*all highly magnified.*

Gen. III. ATHROTAXIS, *Don.*

Flores monoici. MASC. *Amenta* terminalia, brevissima. *Stamina* plurima, axi imbricata; stipite filiformi, complanato, in squamulam verticalem producto; antheris 2-locularibus; loculis discretis, connectivi basi continuis, postice bivalvibus. *Pollen* sphæricum v. depressum. FŒM. *Amenta* subglobosa. *Squamæ*

plurimæ (8–20), imbricatæ, supra unguem toro transverso (squama ovulifera v. ovario operto adnato) incrassatæ. *Ovula* in quavis squama 3–6, toro inserta, pendula, orthotropa, alata, apice emarginata, breviter tubulosa. *Strobilus* subglobosus; squamis subligneis, imbricatis. *Semina* in quavis squama 3–6 v. pauciora, ovata, compressa, hilo transverse lineari; testa crustacea, late alata; *embryo* cylindricus, albumine parco immersus, cotyledonibus 2.—Arbores *sempervirentes, erectæ v. depressæ;* ramis *cylindricis;* foliis *subulatis, arcte v. laxe imbricatis, basi decurrente-adnatis;* gemmis *nudis.*

A small genus, confined to the mountains of Tasmania.—*Stems* erect or depressed, branched; branches covered with imbricating, subulate or triangular leaves. *Flowers* monœcious. *Male cones* small, with many imbricating stamens, each formed of a slender stipes, expanding into a transverse, peltate disc, from which the two anther-cells hang. *Pollen* spherical and depressed. *Female cones* terminal, nearly globose, of numerous (ten to twenty) imbricating scales, having a thickened, broad disc, from which three to six ovules hang; the ovules are compressed, almost winged, notched at both ends, and point downwards and inwards towards the axis of the cone. *Cone* woody, globose. *Scales* spreading, each rhomboid, with three to six winged seeds. The main body of the scale is here a bract, and the broad disc on its face is the adnate, open ovary, or ovuliferous scale. (Name from *αθρος, crowded,* and *ταξις, order;* in allusion to the crowded scales of the cone.)

1. **Athrotaxis cupressoides** (Don in Linn. Trans. xviii. 172. t. 13. f. 2); foliis arctissime imbricatis late rhombeo-ovatis obtusis appressis obtuse carinatis, antherarum connectivo elliptico obtuso, strobili squamis 10–12, seminibus 3.—*Hook. Ic. Pl.* 559 (*excl. semina?*); *Nob. in Lond. Journ. Bot.* iv. 149; *Endl. Syn. Conif.* 196. Cunninghamia cupressoides, *Sieb. et Zucc. Fl. Jap.* ii. 9 *in not.* (*Gunn,* 365.)

Hab. Lake St. Clair, Pine River, near Marlborough, and Western Mountains, *Gunn, etc.*—(Fl. Dec.) (*v. v.*) (Cultivated in England.)

A conical tree, 20–45 feet high (*Archer*), with a trunk sometimes 15 feet in girth at $3\frac{1}{2}$ feet above the ground. *Branches* ascending, with spreading, distichous branchlets, densely covered with closely imbricating leaves, obscurely quadrifarious; the branches, together with the leaves, are about $\frac{1}{4}$ inch diameter, and narrower than in either of the following species. *Leaves* minutely ciliated, rhomboid-ovate, blunt, bluntly keeled. *Cones* about as large as a hazel-nut, generally cernuous. *Scales* closely imbricating, with a short dorsal rostrum. *Seeds* quadrate or nearly orbicular, with thick, spongy wings.

2. **Athrotaxis selaginoides** (Don in Linn. Trans. xviii. 172. t. 14); ramis robustis, foliis undique imbricatis laxiusculis incurvis subulato-lanceolatis acuminatis dorso convexis carinatis, antherarum connectivo elliptico acuto, strobilis ovato-globosis, squamis 20–24 abrupte acuminatis, seminibus 6.—*Hook. Ic. Pl. t.* 574; *Endl. Syn. Conif.* 194. Cunninghamia selaginoides, *Sieb. et Zucc. Fl. Jap.* ii. 9 *in not.* (*Gunn,* 368.)

Hab. Falls of the Meander, and other rivulets on the Western Mountains, Cumming's Head, etc., *Gunn, Archer.*—(Fl. Jan.) (Cultivated in England.)

A tree, attaining 45 feet in height (*Archer*), with stout, much distichously divided branches, covered with rather lax, incurved, subulate or lanceolate-subulate, acuminated leaves, which are imbricated all round, $\frac{1}{2}$ inch long in young specimens, broader and $\frac{1}{3}$ inch long in mature ones, convex and obscurely keeled at the back. *Cones* globose, rather pointed, with about twenty to twenty-four scales, each with an acuminate point. *Seeds* with a broad, membranous wing.

I have a solitary scrap of what is either this or a new species, collected on the Huon River, and sent by Mr. Backhouse; the leaves are much laxer and less numerous, but otherwise the same.

3. **Athrotaxis laxifolia** (Hook. Ic. Pl. t. 573); ramis tenuibus, foliis laxe imbricatis erecto-incurvis ovato-lanceolatis acutis dorso convexis carinatis, strobilis ovato-globosis, squamis sub-15 acuminatis, semi-

nibus 4 lato-oblongis, ala spongiosa.—*Nob. in Lond. Journ. Bot.* iv. 149; *Endl. Syn. Conif.* 196. (*Gunn*, 369.)

Hab. Falls of the Meander River, and other rivulets near the summit of the Western Mountains, *Gunn, Archer.*—(Fl. Jan.)

A small tree, 25–30 feet high (*Archer*). Very similar in character to *A. cupressoides*, from which it differs chiefly in the loosely imbricated, longer leaves; the cones and seeds are more similar to those of *A. selaginoides*; it is in many respects intermediate between the two previously-described species, and possibly only a variety of the latter plant.

Gen. IV. PHEROSPHÆRA, *Archer.*

Flores dioici. Masc. *Amenta* parva, globosa v. oblongo-cylindracea. *Stamina* imbricata, subsessilia, axi inserta; antherarum loculis 2, connectivo squamæformi transverse oblongo latioribus, extus deorsum hiantibus; pollen depressum, trigonum, angulis globoso-inflatis opacis, v. oblongum, curvum, apicibus inflatis opacis. Fœm. *Amenta* parva, ovata. *Squamæ* (ovaria aperta) sub-12, laxe imbricatæ, naviculares, ovatæ, concavæ, apice incurvo deciduæ. *Ovulum* prope basin squamæ solitarium, globosum, inversum, foramine late aperto. *Semina* solitaria, immatura erecta, a dorso valde compressa, late ovata, utrinque alata?, basi subcordata.—Frutex *prostratus?, ramosus;* ramis *fastigiatim ramosissimis;* ramulis *angulatis, cum foliis arctissime imbricatis vix* 1 *lin. latis;* foliis *ramulo appressis, sub-*$\frac{1}{2}$ *lin. longis, late triangulari-ovatis, obtusis, trigonis, obtuse carinatis, marginibus ciliolatis;* amentis masculis *terminalibus, fere globosis, ramulis paulo latioribus, flavis;* squamis antherarum *fere duplo latioribus quam latis, apice obtuso;* amentis fœmineis *terminalibus, decurvis;* squamis *sub-*8, 1 *lin. longis, viridibus.*

1. **Pherosphæra Hookeriana** (Archer in Lond. Journ. Bot. ii. 52 in part, quoad syn.).—Microcachrys tetragona ♀, *Nob. in Lond. Journ. Bot.* 150, *non* Athrotaxis? tetragona, *Hook. Ic. Pl. t.* 560. (Tab. XCIX.)

Hab. Mountains near Lake St. Clair, *Gunn.*—(Fl. Jan.)

The extraordinary similarity between the branchlets of this plant and the *Dacrydium Franklinii*, together with its having been sent to me mixed with specimens of *Microcachrys tetragona* and *Diselma Archeri*, has led to great confusion, and to much doubt on my part how to dispose of the synonymy of some of the Tasmanian Conifers, without leading to a further complication. In 1843 was published, in Hooker's 'Icones Plantarum,' Gunn's number 367 (erroneously quoted as 369), under the name of *Athrotaxis? tetragona;* of this few specimens were received: they had no female flowers, but the males so entirely resembled those of an *Athrotaxis*, that it was referred to that genus doubtfully. In 1842 Gunn sent more male specimens of the same plant, mixed with another, which latter he assumed to be its female flowers; and these, differing entirely from those of an *Athrotaxis*, I described under the name of *Microcachrys tetragona*. My genus *Microcachrys* therefore consists of male *Athrotaxis? tetragona*, Hook., and the female of another plant. In 1847, Mr. Archer, having found the true female of *Athrotaxis? tetragona*, Hook., and perceiving that it was neither that of an *Athrotaxis*, nor agreed with my description of the female flower of *Microcachrys*, described it as a new genus, and called it *Pherosphæra Hookeriana* (in allusion to its orbicular ovules), under which he quoted *Athrotaxis? tetragona*, Hook., and *Microcachrys tetragona* ♂, Hook. fil. At the same time Mr. Archer discovered a third genus of these Micro-conifers, and erroneously assuming it to be what I had described as *Microcachrys tetragona* ♀, transfers that name to it. Lastly, at a still later period I received from Gunn fine male and female specimens of the original *Athrotaxis? tetragona*, Hook., numbered 367, and under the same number male and female specimens of the plant Archer had referred to my *Microcachrys*, but no more specimens of the plant whose female flowers I originally confounded with *Athrotaxis*, and published as *Microcachrys*.

Fortunately Mr. Archer, being now in England, has kindly aided me in clearing up this confused matter, and

we have together come to the conclusion, that it will create the least perplexity to retain the name *Microcachrys tetragona* for the plant figured originally as *Athrotaxis? tetragona*, and whose male flowers I originally described as *Microcachrys;* its small, regularly formed cone renders the name very applicable. The name *Pherosphæra* we transfer to the plant whose female flowers I confounded with *Microcachrys*, and whose male flowers being collected into almost globose amenta, will justify the appellation; and for the plant which Mr. Archer supposed to be my female *Microcachrys*, we propose the name *Diselma*, in allusion to the two ovuliferous scales. I have in this matter to express further my obligation to Mr. Archer, both for his assistance in settling the synonymy, and for some very valuable notes and observations upon the pollen and ovules, etc., of many of the Tasmanian Conifers, made upon living specimens. I may add that the *Diselma* and *Microcachrys* have quadrifarious branches, and are all but undistinguishable, except by their female flowers; the branchlets of *Dacrydium Franklinii* and *Pherosphæra Hookeriana*, which have less regularly imbricated leaves, are also almost undistinguishable when not in flower.

I have no description of the habit, etc., of *Pherosphæra*, which, from being mixed with *Microcachrys*, is probably a prostrate plant. The branches are slender, very much branched, and the leaves slightly compressed on each side of the keel. Male cone broader than the branchlet; stamens like those of *Athrotaxis*. Female cones decurved, small, of six to eight boat-shaped, deciduous scales, each bearing a solitary ovule, with two complete integuments.—PLATE XCIX. *A*, male, and *B*, female plants; 1 and 2, front and back view of leaves; 3, male cone; 4 and 5, stamens; 6, pollen; 7, female cone; 8, scales and immature seeds; 9, scale, with ovule; 10, ditto, with unripe seed; 11, ovule; 12, the same, with the outer integuments cut open; 13 and 14, fully formed, immature seeds; 15, the same, cut longitudinally:—*all very highly magnified.*

Gen. V. PODOCARPUS, *L'Hérit.*

Flores dioici, rarius monoici. MASC. *Amenta* terminalia v. axillaria, solitaria v. in pedunculo communi spicata, basi bracteata. *Stamina* plurima, stipite brevissimo; *antheris* 2-locularibus, connectivo squamæformi, loculis marginalibus extrorsum dehiscentibus. *Pollen* curvatum. FL. FŒM. spicati; spica 1-2-flora. *Ovulum* solitarium, infra apicem squamæ sessile, inversum, cum squama longitudinaliter adnatum. *Semen* inversum, tegumento exteriore carnoso cum squama adnato, interiore osseo. *Embryo* in apice albuminis farinacei antitropus; *cotyledonibus* 2 brevibus.—Frutices *v.* arbores; foliis *alternis, distichis imbricatisve, rarius oppositis, plerumque dimorphis;* gemmis *perulatis.*

1. **Podocarpus alpina** (Br. ex Mirbel in Mem. Mus. xiii. 75); foliis subdistichis v. undique insertis brevissime petiolatis linearibus lineari-oblongisve obtusis subtus glaucis costa marginibusque incrassatis, ament. masc. solitariis subfasciculatisve, foliis subæquilongis, connectivo apice in cornu producto, drupa parva, pedunculo carnoso apice inæqualiter oblique bifido.—*Bennett, in Horsfield, Plant. Jav. Rar.* 40; *Nob. in Lond. Journ. Bot.* iv. 150; *Endlicher, Syn. Conif.* 214. (*Gunn*, 226.)

Var. β. *Lawrencii;* foliis acuminatis pungentibus.—P. Lawrencii, *Nob. in Lond. Journ. Bot.* iv. 151.

HAB. Mountainous localities, elev. 3–4000 feet: Mount Wellington, Marlborough, Western Mountains, etc.—(Fl. Jan.) (*v. v.*) Var. β. River Mersey, near Mount Gog, *Lawrence, Archer.*

DISTRIB. Alps of Victoria, Mounts Buller and Hotham, *Mueller.* (Cultivated in England.)

Generally a small straggling bush, but sometimes rising to a tree 13 feet high (*Archer*). *Branches* spreading. *Leaves* inserted all round the stem, or obscurely bifarious, spreading, often somewhat recurved, linear or linear-oblong, obtuse, acuminate in var. β, $\frac{1}{4}$–$\frac{3}{4}$ inch long, tapering to a very short petiole, glaucous beneath, with very thick margins and costa. *Male spikes* cylindrical, scarcely so long as the leaves, sessile, solitary or fascicled. *Pollen*-grains curved. *Drupe* small, two lines long, elliptical, seated on or towards the apex of one fork of a bifid, fleshy, scarlet, subcylindric peduncle, which is larger than the drupe, and consists of several fleshy bracts adnate to the swollen peduncle.—This is most nearly allied to the New Zealand *P. nivalis*, Hook., which differs in its blunt connectivum. Mr. Archer agrees with me in considering that *P. Lawrencii* is only a variety of *P. alpina*, whence it becomes

doubtful whether *P. alpina* should not be considered the alpine form of *P. Lawrencii*. (Name from πους, *a foot*, and καρπος, *fruit*; in allusion to the swollen peduncle of the fruit.)

Gen. VI. DACRYDIUM, *Banks et Sol.*

Flores dioici. Masc. *Amenta* terminalia, solitaria, sessilia v. basi bracteata. *Stamina* plurima, axi inserta, stipitibus brevissimis; *antheris* 2-locularibus, connectivo dilatato, loculis oppositis extrorsum dehiscentibus. *Pollen* curvum. Fœm. *Squamæ* terminales, solitariæ v. laxe in spicam dispositæ. *Ovulum* solitarium, apicem versus squamæ sessile, inversum, integumento exteriore laxo, abbreviato, interiore in collum breve producto. *Semen* tandem erectum, squamæ insidens, integumento exteriore basi cincto, integumento interiore laxo carnoso v. coriaceo ore lato hiante, intimo osseo. *Embryo* in apice albuminis farinacei v. granulosi antitropus.—Arbores *v. rarius* frutices; foliis *acerosis, undique imbricatis v. quadrifariam arctissime imbricatis, triangularibus, squamæformibus et ramulis appressis;* gemmis *nudis*.

The few species known of this genus are natives of New Zealand, where three species have been detected, and several inhabit Polynesia and the Malayan peninsula and islands. Most are large trees, with narrow, acerose leaves; but the Huon Pine and some others have triangular, rhomboid, minute, quadrifarious leaves appressed to the branches. The genus is distinguished by the terminal sessile male cones of bilocular anthers, like those of *Athrotaxis;* and by the female flowers consisting of a minute, solitary, terminal scale, or several scales arranged in a loose spike; each scale bears a solitary, inverse ovule, which, as it advances to the mature seed, turns up and becomes erect, with a thin outer coat, and crustaceous or osseous inner one. The seed is girt at the base by a shallow, oblique, cup-shaped disc; this is the outer coat of the ovule, which does not enlarge, as the ovule advances to maturity, so as to form a covering to it. (Name from δακρυς, *a tear;* in allusion to the weeping habit of the species.)

1. **Dacrydium Franklinii** (Nob. in Lond. Journ. Bot. iv. 152. t. 6); elatum, ramulis pendulis una cum foliis filiformibus, foliis dense quadrifariam imbricatis rhombeo-ovatis subacutis dorso carinatis, ament. fœm. decurvis spicæformibus, squamis minutis remotis, semine erecto ovato compresso.—*Endl. Syn. Con.* 227. (*Gunn,* 1248.) (Tab. C. *A.*)

Hab. Southern and western coasts of the Island: Huon River, Macquarrie Harbour, etc., *A. Cunningham.*—(Fl. Jan.) Colonial name, "Huon Pine." (Cultivated in England.)

This is perhaps the most local of all the *Coniferæ* whose wood has been turned to much account, being confined in its distribution to the south-west quarter of Tasmania, and I believe wholly to the watersheds of the Huon and Gordon Rivers, where it occurs abundantly. It forms a tall, straight, pyramidal tree, 80–100 feet high, and 10–20 in girth at the base. *Wood* beautiful, close-grained, and very well adapted for planking and boat-building. *Branches* spreading; *branchlets* pensile, much divided, almost quadrifarious, from being densely covered with the minute, ovate, rhomboid, sharply-keeled leaves, each about ½ line long. *Male cones* cylindric; *females* minute, curved, terminal spikes, containing four to eight minute adherent scales, on each of which is seated a sessile ovule, whose outer integument is abbreviated, and the apex of the inner is exserted, and points to the peduncle of the spike. On ripening, the fruit becomes erect, and the outer integument also enlarges a little, forming a cup that embraces the lower part of the seed. *Seed* very minute, compressed dorsally, ovate, obtuse, with a blunt apiculus: outer coat or testa coriaceous, that next to it membranous, and closely applied to a crustaceous inner one. *Albumen* granular, invested with a delicate hyaline membrane. *Embryo* not found in any of my specimens. In germinating the Huon Pine has two linear, cotyledonary leaves, from which an axis ascends covered with imbricating leaves exactly like those of the old plant.—Plate C. *A.* Fig. 1, male branch and cones; 2, male cone; 3 and 4, back and front views of anthers; 5, pollen; 6, female branch and cones; 7, female cone; 8, scale and ovule; 9, longitudinal section of ditto; 10, 11, and 12, back, side, and front views of fully formed seeds; 13, vertical section of ditto; 14, vertical section of albumen; 15, leaf; 16, seedling plant; 17, cotyledonary leaves and young axis:—*all but figs.* 1, 6, *and* 16, *highly magnified.*

Gen. VII. MICROCACHRYS, *Hook. fil.*

Flores dioici. Masc. *Amenta* terminalia, solitaria, ramulo paulo latiora, sessilia, ovata. *Antheræ* imbricatæ, biloculares, loculis connectivoque ut in *Athrotaxi*. *Pollen* ut in *Pherosphæra*. Fe. fœm. *Amenta* parva, oblonga, terminalia, solitaria, sessilia. *Squamæ* patentes, arcte imbricatæ, late ovato-rhomboideæ, incurvæ. *Ovulum* solitarium, deorsum spectans, integumento exteriore abbreviato. *Strobilus* decurvus, ovoideus. *Semina* immatura dorso compressa, integumento exteriore basi cincta.—Frutex *prostratus, ramosus;* ramis *ramulosis, ramulis e foliis arcte imbricatis tetragonis;* foliis *triangulari-rhombeis late ovato-rhombeisve,* 1 *lin. longis, obtusis, dorso obtuse carinatis, marginibus ciliolatis;* amentis masculis *ovoideis, ramulo paulo latioribus;* antheris *connectivo oblongo, eroso-ciliato, loculis angustiore;* amentis *fœmineis masculis latioribus, sub*-12-*floris.*

1. **Microcachrys tetragona** (*M. tetragona* ♂, Nob. in Lond. Journ. Bot. iv. 150, non Archer in Hook. Journ. Bot. ii. 51). Pherosphæra Hookeriana ♂, *Archer, l.c.* Athrotaxis? tetragona, *Hook. Ic. Pl. t.* 560. (*Gunn,* 367.) (Tab. C. *B.*)

Hab. Summit of the Western Mountains, *Gunn, Archer.*—(Fl. Feb.)

For the confused synonymy of this genus see the remarks upon *Pherosphæra Hookeriana.* The present is a very scarce plant, and apparently always prostrate, forming low bushes, with depressed branches a foot or two long; *branchlets* stouter than in *Pherosphæra* and *Diselma,* tetragonous from being densely clothed with the imbricate, triangular, ovate, or rhomboid leaves, which have minutely ciliated margins. *Male flowers* in small, oblong, terminal cones, a little broader than the branchlets. *Anther* with an oblong, ciliate and erose, erect, obtuse connectival scale, and two divaricating broad cells below. *Female cone* rather larger and broader than the male, its scales closely imbricating all round, in which respect (and habit) the genus differs from *Dacrydium,* to which, in the structure of the scale and ovule, it is very nearly allied.—Gunn says that this plant bears fleshy red berries, but I suspect a mistake; there are none on the specimen, though he says some are sent. (Name from μικρος, *small,* and καχρυς, *a cone.*)—Plate C. *B.* Fig. 1, male branch; 2, portion of ditto; 3, front, and 4, back views of leaves; 5, male cone; 6, front, and 7, back views of stamens; 8, pollen; 9, female branch; 10, female cone; 11, scale and ovule; 12, vertical section of scale; 13, ditto of scale and ovule; 14 and 15, ovules; 16, vertical section of ditto; 17, nucleus; 18, immature seed; 19, ditto, almost mature; 20, vertical section of ditto, with outer integument removed; 21, nucleus and its membrane, and pollen-tube; 22, ditto with membrane removed; 23, vertical section of seed, with immature embryo; 24, immature embryo:—*all but figs.* 1 *and* 9 *very highly magnified.*

Gen. VIII. PHYLLOCLADUS, *Rich.*

Flores monoici. Masc. *Amenta* terminalia, conferta, cylindrica, basi bracteata. *Stamina* axi inserta, stipitibus brevissimis; *antheris* bilocularibus, loculis connectivo squamæformi adnatis latere longitudinaliter dehiscentibus. Fl. fœm. *Amenta* 1-pauciflora, terminalia, squamis alternis navicularibus, summis effœtis, distinctis v. in capitulum confluentibus 1-ovulatis. *Ovula* ut in *Dacrydio.* *Semen* erectum, basi squama urceolata carnosa cinctum; integumento externo membranaceo abbreviato; interiore membranaceo, intimo crustaceo arcte appresso. *Embryo* in axi albuminis antitropus; *cotyledonibus* 2, brevissimis.—Arbores *mediocres;* ramis *verticillatis;* foliis *minutis squamæformibus;* ramulis *alternis, distichis, subverticillatisve, phyllodineo-dilatatis, rhombeis cuneatisve, flabellatim v. pinnatim venosis, margine foliis squamæformibus instructis, apice gemmam perulatam gerentibus;* bracteis *coriaceis, interdum in fructu carnosis.*

1. **Phyllocladus rhomboidalis** (Richard, Conif. 130. t. 3. f. 2); phyllodiis distichis cuneatis rhombeisve inciso-serratis, ament. masc. fasciculatis brevibus, fœmineis capitatis sessilibus pedunculatisve.—

Endl. Syn. Conif. 235. P. Billardierii, *Mirbel in Mem. Mus.* xiii. 76. P. aspleniifolia, *Nob. in Lond. Journ. Bot.* iv. 151. Thalamia aspleniifolia, *Spreng. Syst.* iii. 890. Podocarpus aspleniifolia, *Lab. Nov. Holl.* ii. 71. *t.* 221. (*Gunn*, 327.)

Hab. Common in damp forests, especially in the mountainous and southern parts of the Island.—(Fl. Nov.) (*v. v.*)—Colonial name, "Celery-topped Pine" and "Adventure Bay Pine." (Cultivated in England.)

Of this curious genus there are only three other species known, one on the lofty mountain of Kini Balou, in Borneo, and two in New Zealand, of which one is alpine, and so closely resembles this that I almost doubt its being distinct. As a genus it approaches very closely indeed to *Dacrydium*, from which it differs in the scale of the female flowers being larger and very coriaceous and thickened, and in the leaves and branchlets of old plants being connate, and forming flat coriaceous phyllodia. In seedling plants the leaves are linear-acuminate, one-nerved, glaucous beneath, and the first-formed phyllodia are also nerved and glaucous below, and present at their margins the leaves of which they are composed more or less free; besides these phyllodineous leaves there are subulate scaly ones on the stems, which form bracts beneath the inflorescence, and from the axils of which the phyllodia spring: young plants present all gradations between these and the true linear leaves, which are never found on the old plants. —A slender monœcious or diœcious tree, 15–60 feet high, with a trunk sometimes 2 feet in diameter, horizontal, whorled lower branches, covered with distichous branchlets, giving off opposite, alternate, whorled, coriaceous, rhomboid, lobed, and cuneate, crenate and inciso-serrate phyllodia, ½–1½ inch long, composed of branchlets and leaves united into one flat frond. *Amenta* terminal, the males about ⅛ inch long, fascicled, two or more together; *females* globose, about as large as a pea, of four to six, sessile, coriaceous, connate scales, into which the ovules are sunk. Each ovule is surrounded at its base with a membranous scale, which is its abbreviated outer integument. (Name from *φυλλον, a leaf*, and *κλαδος, a branch*.)

END OF VOLUME I.

PATENTED DEC

JOHN EDWARD TAYLOR, OF LES QUEEN COUNTY,

Fitch del et lith

Vincent Brooks Imp

Clematis linearifolia, *Steud.*

A. Ranunculus scapigerus, *Hook var γ decarvus*

Fitch del et lith.

Vincent Brooks Imp.

B Ranunculus inconspicuus, *H.f.*

Fitch del. et litn

Vincent Brooks Imp

Hibbertia ericæfolia. *H.f.*

Fitch del. et lith.

Vincent Brooks Imp.

Hutchinsia australis, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

Drosera gracilis , *H.f.*

Fitch del et lith.

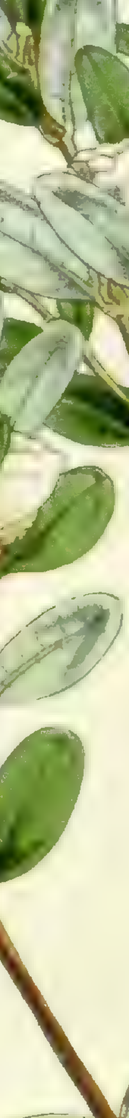
Vincent Brooks Imp.

Drosera foliosa, H.f

Fitch del. et lith.

Vincent Brooks Imp.

A. Tetratheca procumbens, *Gunn.*
B. T. Gunnii, *Hf.*



Vincent Brooks Imp

Eucryphia Milligani, Hf

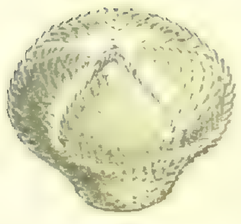
Birch del. et lith.

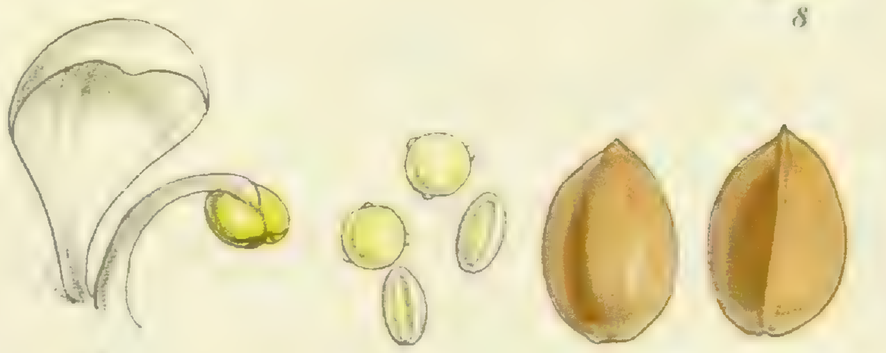
Vincent Brooks Imp.

Phebalium? truncatum, *H.f.*

Fitch del et lith

Vincent Brooks Imp





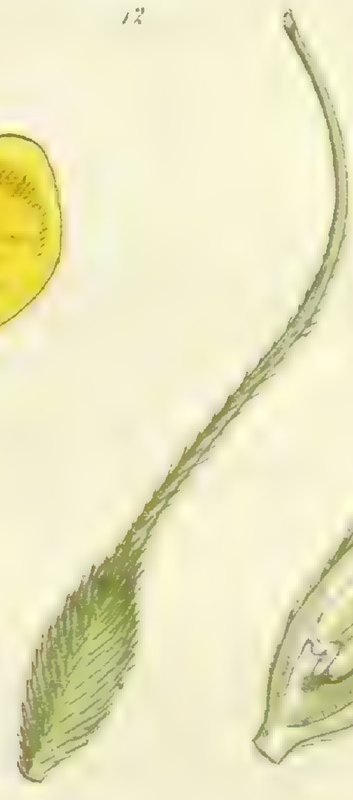
Cryptandra Cunn. M.S.

B. Cryptandra pimeleoides, *Hf.*

A. Cryptandra alpina, *H.f.*

Finch del et lith

Vincent Brooks Imp



Fitch del. et lith.

Vincent Brooks Imp

Pultenæa Gunnii, *Benth.*

Fitch del. et lith

Vincent Brooks Imp.

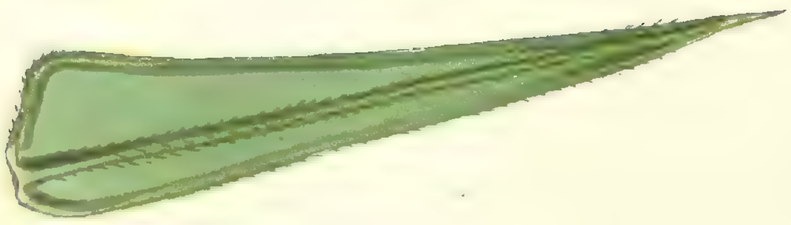
Hovea heterophylla

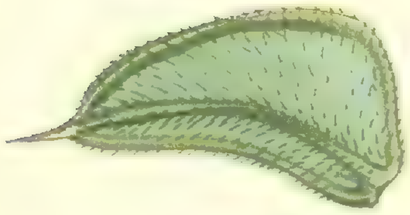
Fitch del. et lith

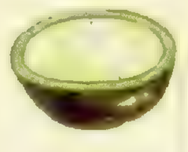
Vincent Brooks Imp

Bossiæa cordigera, *Benth.*

Vincent Brooks Imp.





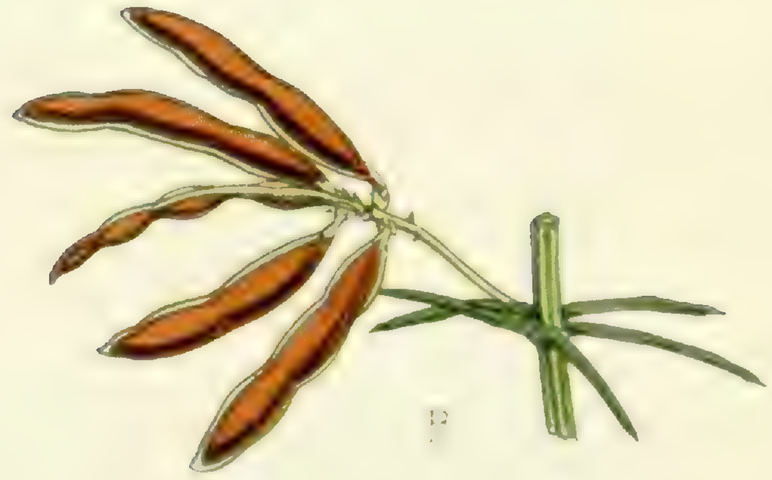


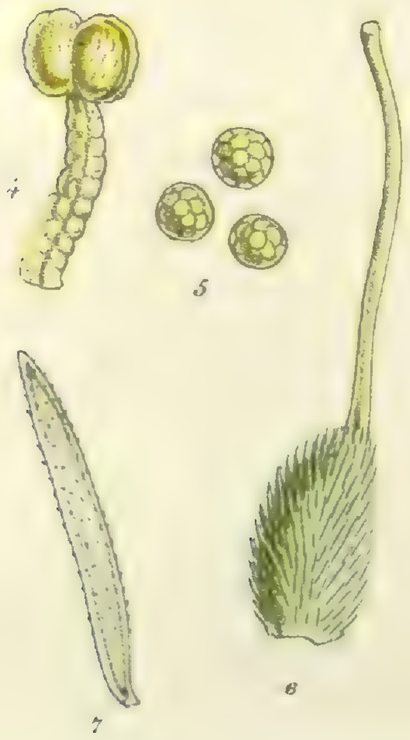
Acacia Gunn . , *Benth*

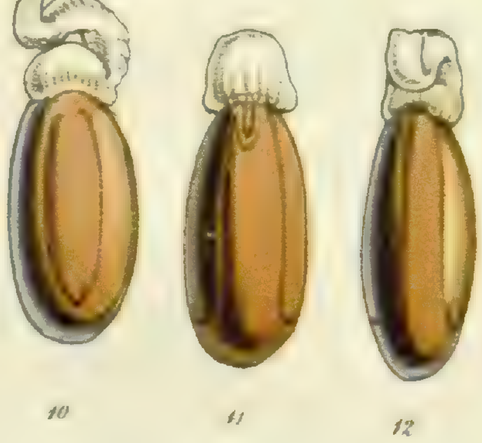
Fitch del et lith

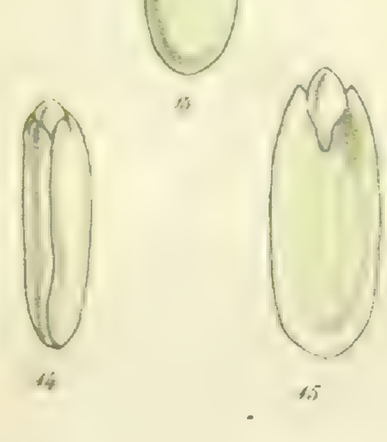
Vincent Brooks Day

Acacia Stuartiana, *Muell*









Fitch del et lith.

Vincent Brooks Imp.

Acacia ovoidea, *Benth.*

Nesb. del et lith.

Vincent Brooks Imp.

Epilobium Billardierianum , *Ser.*

Fitch del. et lith.

Vincent Brooks Imp.

Haloragis Gunnii, *H.f.*

A. Myriophyllum integrifolium. *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

B. Myriophyllum pedunculatum. *Hf.*

Fitch del. et lith.

Eucalyptus Risdoni, *Hf.*

2.

Eucalyptus coccifera,

Fitch del. et lith.

Vincent Brooks Imp.

Eucalyptus urnigera, *H.f.*

Fitch del et lith.

Vincent Brooks

Eucalyptus Gunnii , *H.f.*

Fitch del. et lith

Vincent Brooks Imp

Eucalyptus gigantea. *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

Eucalyptus nitida, *H.f.*

Fitch del. et lith.

Vincent Brooks Imp.

Leptospermum rupestre, *Hf.*

B.

A.

1.

6.

7.

8.

2.

4.

5.

3.

Fitch del. et lith.

Vincent Brooks Imp.

Bauera rubioides, *Andr.*

var. microphylla.

A. Hydrocotyle Tasmanica, *Hf*

B. Hydrocotyle peduncularis, *Hf*.

Fitch del. et lith.

Vincent Brooks Imp

A.

B.

C.

1.

2.

3.

1.

2.

3.

Fitch del. et lith.

Vincent Brooks Imp

A. Hydrocotyle vagans, *Hf.*
B.&C. H. pterocarpa, *Muell.*

1. 2. 3. 4. 5. 6. 7.

del. et lith. Vincent Brooks Imp.

Diplaspis Hydrocotyle, *Hf.*

Fitch del. et lith.

Dichopetalum ranunculaceum, *Muell.*

Plate XXIV.

A. var. suffocata.

B. var. trudentata

C. var. fulva.

D. var affinis

Hemiphues bellidioides, *Hf.*

Fitch del et lith

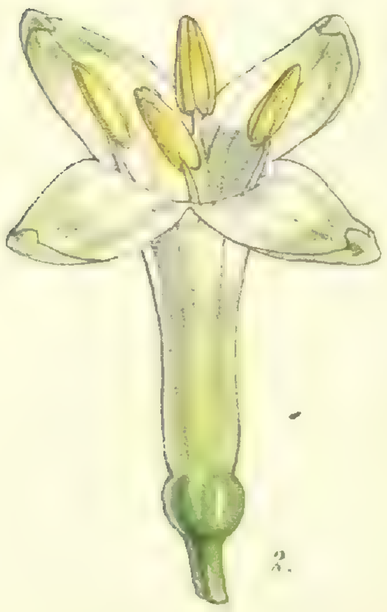
Vincent Brooks imp.

Panax Gunnii, *H.f.*

Opercularia ovata, *H.f.*

Vincent Brooks Imp

1.



2.

3.

Asperula asperuloides, *H.f*

2

1.

4.

B.

3

5

Fitch del et lith.

Vincent Brooks Imp

Asperula pusilla, *H.f*

Fitch del et lith.

Vincent Brooks Imp.

Galium ciliare, *Hf.*

Fitch. del. et lith.

Eurybia obcordata, *H.f.*

E. alpina, *H.f.*

B.

2.

A.

Eurybia lirata *D.C.*

Fitch del. et lith.

Vincent Brooks Imp

Eurybia gunniana, *D.C.*

Litch del et lith.

A. Eurybia pinifolia *H.f.* *B.* E. floribunda, *H.f*

A.

B

1. 2. 3. 4. 5. 6.

1. 2. 3. 4. 5. 6. 7.

Fitch del. et lith.

Vincent Brooks Imp.

A. Erigeron Tasmanicum, *Hf.* B. Erigeron Gunnii, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp

Brachycome decipiens, *Hf.*

A.

B.

1.

2.

7.

8

3.

5.

6.

1.

3.

2.

8.

5.

6

4.

Fitch del. et lith.

Vincent Brooks Imp.

A. Nablonium calyceroides, *Cass.* B. Brachycome tenuiscapa, *Hf.*

Fitch del et lith.

Vincent Brooks Imp.

Lagenophora montana, *Hf.* *B.* L. Gunniana, *Steetz.*

Plate 2.

A. Cotula australis, *Hf*

B. Cotula integrifolia, *Hf*

Fitch del. et lith

Vincent Brooks Imp

A. Leptinella longipes, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

B. Leptinella intricata, *Hf.*

Skirrhophorus eriocephalus, *Fitch*

Pumilo argyrolepis, *Schl.*

Fitch del. et lith.

Vincent Brooks Imp

Fitch del. et lith.

Vincent Brooks Imp.

A. Ozothamnus rosmarinifolius, *Br*

B. O. Backhousii *H. f*

Fitch del. et lith.

Vincent Brooks Imp

A. Ozothamnus obcordatus. D.C.

B. O. Hookeri, Sonder.

Fitch del. et lith

Vincent Brooks Imp.

A. Ozothamnus scutellifolius, *Hf.* *B.* O. selaginoides. *S. & M.*

A. Ozothamnus lycopodioides, *Hf.* *B.* O. ericæfolius, *H.f.*

A. Raoulia Tenuicaulis, *Hf*

B. Pterygopappus Lawrencii, *Hf*

Fitch del et lith.

Vincent Brooks Imp.

Helichrysum leucopsideum, *D.C.*

Fitch del. et lith

Vincent Brooks Imp

A. Helichrysum pumilum. Hf

B. H. Milliganii, Hf

Plate LV.

Fitch del. et lith.

Helipterum anthemoides, *D.C.*

A. Gnaphalium alpigenum, *Muell.*

B. G. indutum, *H.f.*

C. G? Planchoni, *Hf.*

Fitch del et lith

Vincent Brooks Imp.

J. Fitch del. et lith.

Erechtites Gunnii, *Hf.*

Fitch del et lith

Vincent Brooks Imp.

B. Senecio leptocarpus, *D.C*

A. S. capillifolius, *Hf*

Fitch. del et lith.

Vincent Brooks Imp.

Centropappus Brunonis, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

Microseris Forsteri, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

Scævola Hookeri, *Muell.*

A. Goodenia humilis, *Br.*

Fitch del et lith

Vincent Brooks Imp.

B. Velleia montana, *Hf*

A. Lobelia surrepens, *Hf.*

Fitch del et lith.

Vincent Brooks Imp.

B. Lobelia pedunculata, *Br.*

Fitch del et lith

Vincent Brooks Imp.

Lobelia fluviatilis, *Br.*

A.

B.

4.

2.

5.

3.

1.

3.

B.

Fitch del. et lith.

Vincent Brooks Imp.

Wahlenbergia saxicola, *A.D.C.*

Vincent Brooks Imp.

Gaultheria lanceolata, *H.f.*

Pernettya Tasmanica, *H.f.*

Fitch del. et lith

Vincent Brooks Imp.

Gaultheria antipoda, *Forst. var: j*

Fitch del. et lith.

Vincent Brooks Imp.

B. Cyathodes divaricata, *Hf* *A.* Cyathodes accendens, *Hf.*

Fitch del et lith.

Vincent Brooks Imp.

B. Leucopogon Hookeri, *Sonder.*

A. L. ciliatus, *A.C. var.*

Fitch del. et lith.

Vincent Brooks Imp.

Decaspora Gunnii, *Hf.*

P. verticillata, *H.f.*

Fitch del et lith.

Vincent Brooks Imp.

Pentachondra ericæfolia; *Hf.*

Fitch del et lith.

Vincent Brooks Imp.

Epacris Gunnii, *H.f.*

E. corymbiflora, *H.f.*

Fitch del. et lith.

Vincent Brooks Imp.

B. Epacris Franklinii, *Hf.*

A. Epacris virgata, *Hf.*

A. Archeria serpyllifolia, *Hf.*

Fitch del et lith.

Vincent Brooks Imp.

B. Archeria eriocarpa, *H.f.*

1.

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7.

Fitch del. et lith.

Vincent Brooks Imp

Archeria hirtella, *H.f.*

Fitch del. et lith.

Vincent Brooks Imp

Pilitis acerosa, *Lindl.*

Fitch del et lith

Vincent Brooks Imp

Pilitis Milligani, *H.f.*

Finch del et lith.

Vincent Brooks Imp

Richea pandanifolia, *Hf*

Richea Gunnii, *Hf.*

Fitch del. et lith. Vincent Brooks Imp.

Finch del. et lith.

Vincent Brooks Imp

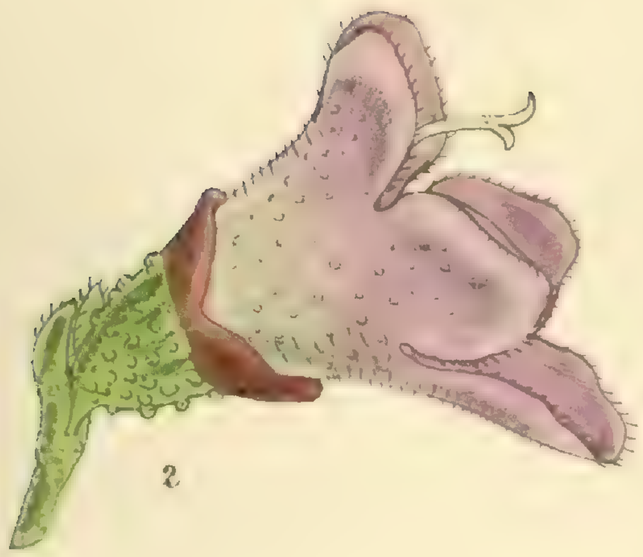
Liparophyllum Gunnii, *H.f.*

A. Mitrasacme paradoxa *Br.*

Fitch del. et lith.

Vincent Brooks Imp.

B M. distylis, *F. Muell* *C.* M. montana, *H. f.*



2.

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Fitch del. et lith.

Vincent Brooks Imp.

Prostanthera rotundifolia; *Br.*

2.

1.

6.

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3.

4.

Fitch del. et lith.

Vincent Brooks Imp.

Prostanthera cuneata *Benth.*

Fitch del. et lith

Vincent Brooks Imp.

Westringia brevifolia, *Benth.*

Fitch. del. et lith.

Vincent Brooks Imp.

Anthocercis Tasmanica, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp

Didymotheca thesioides, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp.

Trichinium spathulatum, *Br.*

1.

1.

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5.

A. Atriplex Billardieri, *Hf.*

Fitch del. et lith.

Vincent Brooks Imp

Pimelea filiformis, *H.f.*

C.

12.

11.

24.

a.

23.

25

1.

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13.

22.

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A.

B.

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21.

Fitch del. et lith.

Vincent Brooks Imp.

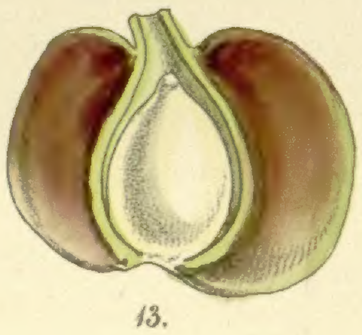
Casuarina suberosa, *Otto & Dietr.*

Fitch del. et lith.

Vincent Brooks Imp.

Frenela australis, *Endl.*

A.



13.

B.

1.

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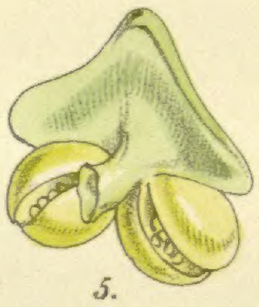
3.



5.

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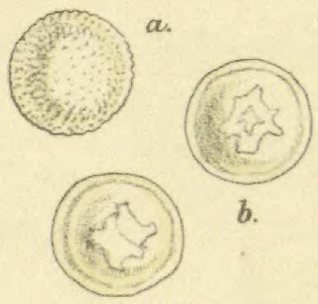

a.

b.

6.

11.

12.

Fitch del. et lith.

Vincent Brooks Imp

Diselma Archeri, *Hf.*

A.

B.

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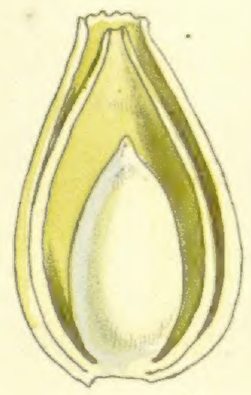
14.


15.

Fitch del. et lith.

Vincent Brooks Imp.

Pherosphæra Hookeriana, *Archer.*

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23.

24.

Fitch del. et lith.

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15.

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14.

16.

17.

Vincent Brooks Imp.

B. Microcachrys tetragona, *Hf.* A. Dacrydium Franklinii, *Hf.*